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Skellefteå *Image: Skebo*

Rural Areas of Skellefteå 2050:
A sustainable place to live, work and stay

Lucky Seven

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Executive Summary

This report calls on the rural development of Skellefteå, as one of the crucial components in fostering sustainability and innovation to become a climate neutral city by 2030. It articulates the opportunity for a group of stakeholders, including citizens, advocacy organizations, private companies, small and medium-size businesses, and local and national governments to transform their city's relationship with nature through a solution called "Smart and Sustainable".

First, the solution proposes the availability of rural community spaces to give a new meaning to the sense of a neighborhood. Second, a novel concept for rural neighborhoods is introduced. They are conceived as 'ecosystems' and 'habitats' where a diverse community feels included while living a sustainable lifestyle. Third, the sharing and performance economy are pivotal for accessing services like transportation to alleviate the need for personal car ownership. Fourth, a variety of housing options are contemplated. From individual houses to co-living spaces ensuring affordability and inclusion for all. Finally, the solution presents a built environment in which the circular economy principles and design for-carbon-neutrality are incorporated in all new buildings and neighborhoods.

The "Smart and Sustainable" solution, pathway and follow-ups included in this report are the result of a participatory backcasting method. A survey to future residents, the dialogue with current residents developed by Skellefteå's Municipality in 2014, and a question and answer session with Skellefteå's Municipality representatives were part of the data collected to support the process. Hence, a novel configuration of the socio-technical system for the rural development of Skellefteå is proposed, based on the following key aspects:

1. The contribution of rural areas to the economy of Sweden. The production and export of goods and services are related to its endowment of natural resources. In the case of Skellefteå: mining, forestry, and agriculture. Further, a wide range of nature-based tourism activities attract people from urban Sweden and abroad.

2. Challenges of rural areas in Sweden. Population aging and decline, and the ability to maintain access to public services in more remote areas are some of the challenges the rural areas in Sweden are facing.

3. Functions and needs based on the dimensions related to human well-being. Housing, the environment, health, community, accessibility to services, jobs, education, life satisfaction, and civic engagement are fundamental criteria for both urban and rural transformations.

4. A vision 2030 for rural Skellefteå. Here, the economic, social and ecological functions will come together in harmony. A desirable future that contemplates nature-positive actions with a firm commitment to equity and well-being for all citizens.

5. A set of functional criteria aligned with the vision for rural Skellefteå. With social cohesion, environmental responsibility, accessibility to services, affordability, digitalization, and nature connection and conservation as the primary criteria to test the plausible solutions related to the vision.

6. External driving forces with the potential to influence the rural transition of Skellefteå. The diffusion of digital technologies and population size and demography are the drivers that could impact the system.

7. Evaluation of different configurations of rural Skellefteå. "Smart and Sustainable" is the prioritized internal scenario that promotes performance and sharing economy through digitalization, while scaling recreation opportunities for higher well-being. 8. The pathway set out in this report takes the insights of the participatory backcasting process and translates them into a feasible roadmap for a smart and sustainable rural transformation.

9. A set of experiments are presented in alignment with the fundamental needs and functions identified. Following the Municipality's development plan for the rural areas of Skellefteå, the criteria under consideration, and future trends that can impact the socio-technical system, the experiments proposed are upcycling of architecture, new mobility options, digitalization of services, E-health, and circular business models for the community.

Contents

List of Figures

List of Tables

1 Introduction

1.1 Motivation for the focus chosen by the group

With an estimated population growth from 73,000 inhabitants in 2019 to 90,000 by 2030, (Skellefteå Kommun, 2018a), Skellefteå will face a crucial challenge in the development of a new society. The Municipality vision "A sustainable place for a better everyday life"[1] not only responds to the change in population composition but shows the Municipality's commitment to the initiative 'Climate Neutral Cities 2030' within Viable Cities innovation program.

As one of the 100 European cities signing the Climate City Contracts, Skellefteå must enhance systemic transformation towards climate neutrality with innovations in governance, transport, energy, construction and recycling, supported by powerful digital technologies. The Municipality's development plan aims at climate neutrality using a holistic and systematic approach. However, to envisage Skellefteå as a living system, where the built environment, social structure and natural capital co-exist in harmony, the city must also innovate its relationship with nature. Thus, the city's rural area plays a key role in this transformation.

Based on the town structure in Skellefteå municipality, the rural area cannot be conceived simply as "not urban". Given its proximity and accessibility to urban centers and the city, rural Skellefteå has strong linkages to the urban sectors in terms of commuting, multi-dimensional flows of goods, environmental services and other economic transactions. Much of the growth in the rural region is connected to the growth of the Skellefteå as a city.

Rural Skellefteå is characterized by its cultural and natural environment that attracts residents and visitors, with areas for diverse activities like fishing and coastal tourism, and access to living agricultural environments with open landscapes and local food production. In addition, the rural areas allocate residential-oriented environments near the city with places accessible to services and the labor market, and large fields with the protected natural environment. Within this context, urban development to climate neutrality must be connected with the ecosystem services provided by the rural area for a successful transition.

Forging positive links between Skellefteå's urban and rural settings will help to safeguard ecosystem services, while ensuring the well-being of residents. According to OECD' (2017), Sweden's rural areas are feeling "left behind" not only in their development but also in the government discourse. In comparison to urban areas, rural areas rank better in terms of housing and the environment, but rank lower on health, income, community, and accessibility to services. Therefore, striving for rural development is key for the systemic transformation Skellefteå is facing.

The Municipality's plan for Skellefteå's rural areas attempts for rural development focused on seven components: collaboration among actors, housing and construction, employment, climate and environment, commercial and public services, communication, and rural areas for all. In accordance with the plan, the current report contemplates three interdependent layers of Skellefteå as a city – society, built environment and nature – to balance their relationship and foster system innovations from a rural perspective.

[1] Author's translation

1.2 Aim and objectives

The aim of the project is to develop a strategy with the help of the Participatory Backcasting (PB) framework, for rural areas of Skellefteå. This is in order to help Skellefteå become a sustainable and attractive city by 2050 with the milestone of being climate neutral in 2030. The following objectives were set for the aim to be fulfilled:

- Identify a vision for Skellefteå rural areas 2050.
- Analyze appropriate solutions for sustainable rural areas in 2050.
- Determine a possible pathway to reach the vision for rural areas of Skellefeå 2050.

2 Methods

This section will discuss the Modular Participatory Backcasting. It also describes the performed data collection.

2.1 The modular Participatory Backcasting

Participatory Backcasting (PB) is a long-term planning approach that entails the development of a desirable future vision and further elaboration of a pathway towards this vision with a particular focus on consensus building among different actors (Pereverza, 2019).

The methodology avoids promoting a particular technology and the local contextualization of visions and criteria, focusing directly on the needs and functions of the studied system. It is characterized by normativity, long-term orientation and focus on consensus building among stakeholders. Specifically, normativity allows the development of a shared desirable future vision by the stakeholders; long-term orientation considers the complex and uncertain environment when system innovations are only possible if long-term goals are reflected in short-term actions; and consensus building among different actors is relevant for the feasibility and execution of the long-term planning (ibid.).

The methodology is divided in 13 modules, showed in the Table 1:

Table 1: Modules of Modular Participatory Backcasting

Module	Description
Problem Orientation	Formulation and specification of a problem to be addressed
System Boundaries	Frame of the socio-technical system associated with the formulated problem: Spatial, temporal, sectorial, social and technical components.
Current Situation	Analysis of relevant features of the current state of the socio-technical system
Stakeholder Analysis	the process of listing, classifying and assessing the influence of stakeholders: examination of power, interests, roles of the involved actors.
Needs and Functions	Exploration of current and future system functions and societal needs to be fulfilled.
Vision	Creation of a desirable vision that defines and clarifies a desirable future for the given system
Criteria	Formulation and quantification of functional aspects that will be used to test the solutions against the vision
Drivers	Identification of external forces that could impact the system (trends and key uncertainties)
Solutions	alternative configurations of the socio-technical system, addressing the vision.
Solution Testing	Selection of the most suitable solution according to the proposed vision
Pathway	Set of changes that are required in order to achieve the chosen solution.
Action Plan	detailed short-term plan in line with the designed pathway, outlining actions needed to reach the solution
Follow-ups	initial monitoring of the solution implementation

(Adapted from Pereverza et al., 2017)

The modularity is added to the primary methodology to address several challenges caused by the ambiguities and the complexities of the approach; the modular design makes the decisions within modules more interdependent than those between modules, improving the adaptability of the participatory backcasting (Pereverza, 2019).

2.2 Description of data collection process and methods

The project combines different tools to collect relevant data used in the development of the main methodology called modular participatory backcasting. The word participatory indicates the focus on collaboration where the input given from the stakeholders in the earlier stages such as problem orientation, system boundaries definition and current situation were key to set the basis for the planning approach.

The perspectives from three different stakeholder groups were collected through the following tools:

- Question and Answer Sessions (3) with the Skellefteå municipality represented by Gustaf Ulander and Petter Johansson
- Questionnaire applied in the KTH environment with the input of 77 participants considered as future citizens of Skellefteå (See appendix 1)

- Residents Dialog with the municipality held in 2014 with the participation of 1500 citizens (See appendix 2) considered as current citizens of Skellefteå

In this sense, the participation in three sessions with the municipality of Skellefteå was used as a primary source of information, providing relevant insights to define the current situation and the main system components including technological and cultural aspects. In addition, extensive literature review with both scientific and non-scientific sources, such as scientific papers in relation to the chosen topic: rural areas and local newspapers and official reports from the municipality which were used to set the system boundaries from a geographical and temporal point of view, aligning the planning approach to the current developments of the area.

It is worth mentioning that public documents and articles were used to identify the interest and power in relation to different aspects in order to perform the stakeholder analysis. On the other hand, the needs and functions were addressed using the Why technique which is based on questioning the outcome of every why in order to come up with the core need, in addition to the analysis of places with similar characteristics that encountered similar challenges, without losing the contextualization of the area in study: Skellefteå.

Additionally, the process of defining the vision, criteria and drivers was based on the principle of co-creation supported by the previous investigation, literature review as well as the residents dialog and insights from a social media community in Facebook group called "Expats and friends, Skellefteå living". Firstly, beginning with a divergent process guided by techniques such as brainstorming and finalizing with a convergent process of a consensus-building exercise, having the UN Sustainable Development Goals as a framework to align the multiple ideas.

Lastly, the final stages were supported by the results from an applied questionnaire, which contributes to the configuration of the solutions and their testing, having a clear focus on system innovation rather than current system optimization.

3 Results

In this section, the outcomes from each of the participatory backcasting modules are described, in addition to constructive reflections for each subsection and its relation with the complete application of the implemented methodology.

3.1 Problem orientation

More than half of the citizens of Skellefteå live outside the urban areas and live in rural communities. Previously there has been an issue of citizens moving away from the rural areas leading to that schools and other municipal services closing. However, currently, there is an increased demand to live in the rural areas, so there is a big question about how the rural areas will be developed and look in the future (Johansson and Ulander, 2022).

When designing the problem orientation, a framing perspective was used. Working with framing instead of frames emphasizes dynamic processes. It helps the actor understand the situation and the context, and it helps to understand the next steps.By understanding how to work with the identified problem. Framing works as a starting point for possible futures of action. When working with this method, the tools of selecting, naming and categorizing helps with the framing of the situation further. These three tools select features among several

possible ones and then name and categorize them. Using the three tools, the essential and focus area for the problem will be known (Van Hulst and Yanow, 2016).

Using the method of framing means identifying what has value, discovering opportunities from found uncertainties, connecting previously disconnected pieces, and defining the system boundaries meaning what to include and what to exclude. Furthermore, by reframing the initial problem it is possible to find new advantage points to see the system from and analyse new possibilities to unlock. The reframing is not made to find the solution but rather to expand the system's options to renew and develop (Begovic, 2021). Based on the framing and reframing techniques the initial problem was identified and then reframed to adjust the position to change and intervene the system from.

Initial problem: How can rural areas be developed in the future?

Reframing: From a citizens perspective: Sustainable community development in rural areas of Skellefteå

3.2 System boundaries

In this section, the description of the boundaries of the selected socio-technical system in relation to the problem orientation is described.

A system boundary is a theoretical way of separating the system from the rest of the world. The system boundaries define the project's area of impact, the boundaries chosen may eventually determine the amount of free space for system change or solutions (*Modular Participatory Backcasting* n.d.).

It's beneficial to think of a system's environment as a collection of items that aren't system components but may impact or be influenced by it. When formulating the system boundaries various dimensions was considered which include spacial, sectorial, social, technical and temporal boundaries.

Spatial Boundaries constitute geographical and administrative boundaries where the countryside or rural areas of Skellefteå was chosen as the area of study. (See figure 1)

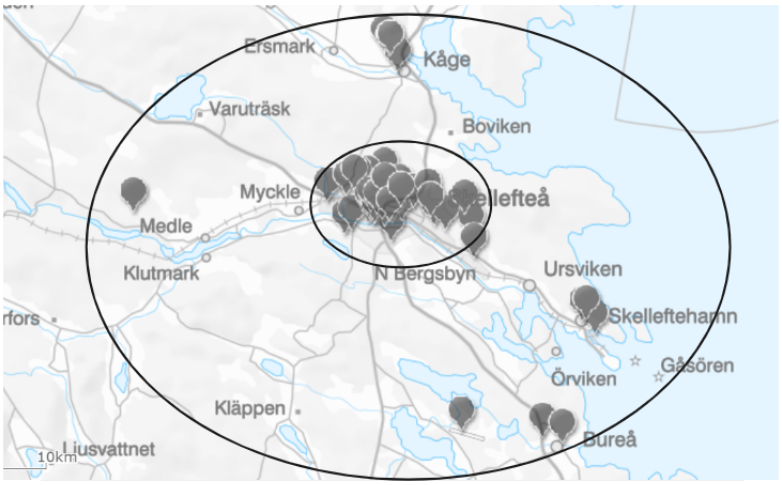


Figure 1: Countryside of Skellefteå

On the other hand, sectorial boundaries consider the type of business involved in the socio-technical system, where big companies from the construction, transport, energy, telecommunication sectors were taken into account, as well as small and medium-size business are further developed in the stakeholder analysis.

Social components are related to the actors involved in the socio-technical system such as current and future citizens, visitors, municipality, national government and advocacy organizations. Each of these actors are also developed in the stakeholder analysis. .

Lastly, technical components are related to the public services and their level of maturity that will enable the pathway towards the system transition. Energy supply, transport systems, waste management and early stages of digitisation are considered.

Lastly, 2050 was selected as a temporal boundary in order to develop the vision and the possible solutions towards the problem orientation.

3.3 Current situation analysis

This module describes the current state of the system under study: The rural areas of Skellefteå. To do so, firstly, the system is defined in its socio-technical configuration. Secondly, key problems of the system are identified, as well as strengths and weaknesses.

To characterize the socio-technical configuration of the system the terminology needs to be clarified. The authors follow Geels' (2002) explanation. The scholar states that socio-technical configurations are a specific view of technology. Here, technology itself has no value. Only the association with human agency, social structures, and organizations give technology a purpose (fulfilling functions). Therefore, technology is closely interconnected with human behavior and it needs to be analyzed together in technological transitions. From the reviewed paper, eight elements of a socio-technical configuration can be extracted:

1. Industrial Structure
2. Technology
3. Infrastructure, Maintenance and Distribution Networks
4. Markets and User Practices
5. Power Resources
6. Regulations and Policies
7. Finance
8. Culture and symbolic Meanings

Each of the listed elements will be described and discussed in the following. Most of the information analysed are provided by the in-depth overview of Skellefteå rural areas for the municipality (Skellefteå Kommun, 2018a, Skellefteå Kommun, 2018b).

Industrial Structure

There are two main industries located in the rural areas of Skellefteå: Agriculture, mining, and forestry. Skellefteå Kommun (2018) emphasises that the industries have a significant im-

portance for the region to establish a long-term sustainable society. But also smaller industries, like reindeer husbandry and commercial fishing, exist in the area. An upcoming industry is for instance wind energy production.

Technology To describe the current technology configuration the authors focus on buildings, transportation, and digital services. The residential rural area buildings are dominated by traditional country houses. The most common transportation mode is using a car to be flexible in an environment with low residential density. Regarding the "E-Strategy" of Skellefteå, the municipality tries to implement more digital services to enhance availability, efficiency, security, and social development (Skellefteå Kommun, 2020). Therefore, these services are still developing.

Infrastructure, Maintenance and Distribution networks

Regarding Skellefteå Kommun (2018) the main distribution networks are road based. Nowadays, the railway experiences new investments, like the "Railway Reserve Norrbontniabanan". But as seen in Figure 2, the infrastructure concentrates along the shore (west). Besides using personal owned cars, buses are used to commute between areas (ExpatFocus, n.d.). As stated in the E-Strategy, the municipality is currently investing in new broadband infrastructure in the area (Skellefteå Kommun, 2020).

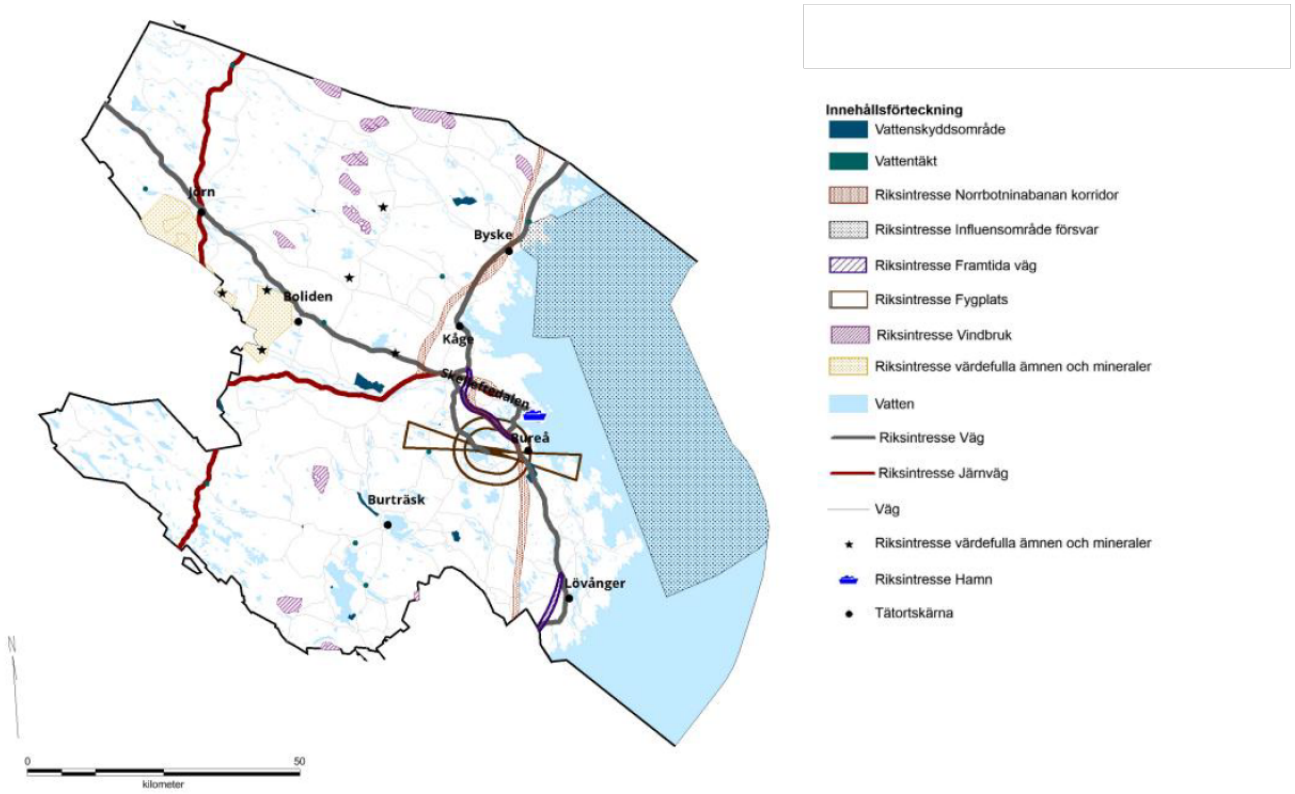


Figure 2: Transport Infrastructure Skellefteå

Markets and User Practices

The norm in the rural areas is to have your own house and car. Due to increase interest in living closer to nature, it is becoming a trend to move back to rural areas. The areas have

previously experienced a population declined and is instead now looking at population growth (Johansson and Ulander, 2022).

Power Resources

The main energy supply in the municipality is coming from the municipal-owned Skellefteå Kraft. Skellefteå Kraft has a high focus on renewable energy sources such as wind, hydropower and bioenergy. They also help customers with advice and installation of solar panels (*El från Förnybara Energikällor Ingår alltid* 2021).

Regulations and Policies

There are many regulations and policies related to building requirements and land use development. There is often a need for permission from the municipality for new construction as well as an extension of the current building (Boverket, 2020).

Finance

Skellefteå is in general a rich municipality with a lot of resources partly because of the municipal owned Skellefteå kraft. Compared to larger cities the housing prices are lower. However, for construction companies wanting to develop projects in the rural areas it can sometimes be hard to regain the initial investment which has made the interest low (Johansson and Ulander, 2022).

Culture and Symbolic Meanings

The cultural and symbolic meanings come from the interaction between different societal groups (Geels, 2002). The culture in Skellefteå is characterized by closeness to nature, entrepreneurship and creativity (Skelleftea, 2015).

3.4 Stakeholder analysis

In order to identify the actors that can affect, or can be affected by, rural development is necessary to contemplate Skellefteå from three interdependent layers. First, the natural ecosystems provide critical ecosystem services. Second, is the built environment that supports key needs such as housing and transport. Third, are the social institutions that build and distribute wealth and prosperity. Once they have been identified, the stakeholder's role in the rural transition is evaluated according to their power and interest. This is a useful tool to assess the influence of actors given that rural development requires deep and complex coordination between all city stakeholders. Figure 3 summarizes the power/interest of each stakeholder included in the analysis.

From a natural structure, the involvement of citizens in their different roles as current residents, future residents and visitors, and advocacy organizations are pivotal for the Municipality vision's success. In these capacities, citizens have a great impact on the rural development of Skellefteå since they are key players in conserving existing natural habitats. Thus, the power of citizens is at an intermediate level, except for visitors since their permanence in the city is temporary.

From an equity perspective, current and future citizens are subjects of social inclusion. They are expected to participate in co-creation processes as part of a new model of city governance, following the aim of the 'Climate Neutral Cities 2030' programme as proposed by (European

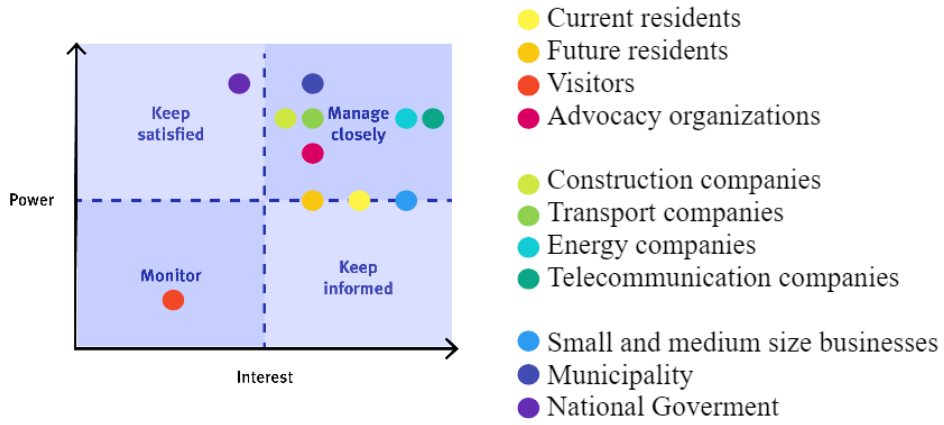


Figure 3: The Power - Interest Matrix

Commission. Directorate General for Research and Innovation., 2020). In the dialogue elaborated by the Skellefteå Municipality (See appendix 2), citizens gave priority to mobility, energy, infrastructures/buildings, circular economy and behavioural change. These priorities are taken as their interest regarding the power/interest analysis. As a result, the interest of citizens in rural development can be considered as high, especially for those contemplating moving directly to rural areas. For the case of visitors, this interest can be low at the beginning, but through the launch of citizen engagement strategies and participatory movements, their compromise to the rural values of Skellefteå can increase.

As noticed by Skellefteå Kommun (2018), individual changes in rural areas can have a great effect because the supply is more limited than in the city. Therefore, active citizen engagement through advocacy organizations is significant as it can facilitate the design and implementation of climate actions for rural development. Therefore, these civil organizations are the ones with higher power and interest among citizens and visitors.

Citizens in their roles as visitors are important actors for a sustainable rural transition. In this sense, their power and interest are assessed considering their attraction to rural landscapes and influence on the local rural values such as nature, culture, history, social capital, and the economy. Although visitors are principal actors in the analysis, their interest in conserving the ecosystem services provided by the nature in rural Skellefteå represents an opportunity for promoting the city as a tourist destination.

Based on the built environment layer, the analysis considers construction, energy, industrial, transport and telecommunication companies. The private sector plays a major role in conserving the natural capital of Skellefteå, supporting the smart growth of the city with infrastructure, and creating, supporting, and scaling inclusive markets. In effect, private companies are powerful actors in terms of fostering carbon-neutral solutions for Skellefteå transition, and providing key needs and functions to promote a smart and sustainable lifestyle among residents.

For rural development, private actions must integrate nature into new or upgraded infrastructure. For instance, a sustainable and coordinated public transport infrastructure for travel,

work commuting, and transport from rural centers to urban areas. Similarly, the incorporation of natural elements in the design of new housing options is an important aspect of rural transformation. Yet, these alternatives must ensure affordability and inclusion. As a result, private interest in rural development is high in terms of the plausible opportunities for job creation and investment in infrastructure, residential sharing, water and energy supply, and public health.

Within the desired rural development, Skellefteå's development plan envisages the possibility of taking advantage of digitalization to bridge distances. Thus, telecommunications companies are key in terms of communication and fast connection to give residents, visitors and businesses the opportunity to stay and work. In this sense, their power and interest are high regarding job opportunities growth through the development of basic industries, hospitality industry, and opportunities for teleworking.

From the social institutions, among the stakeholders to be analyzed are small and medium-size businesses and local and national governments. On the one hand, circular economy business models are necessary to increase local production and collaboration among small business actors. However, their power might not be as high as the private sector. On the other, the local government has the primary responsibility for coordinating across stakeholders, fostering policy innovation, conserving the natural habitat, leading smart growth, and mobilizing investments for nature-based rural transformation. Consequently, their power and interest in rural development are high. Equally important is the role of the national government. The advocacy and accountability from the highest levels of government for sustainable development in cities like Skellefteå must be translated into practical plans and action-oriented strategies.

Providing for the needs of a growing population, while safeguarding and restoring the natural capital of rural Skellefteå calls for multi-stakeholder action. The approach to rural development considered in this report will require close coordination between the actors analyzed. This will be explained in greater detail in the pathway section for the selected solution.

3.5 Needs and system functions

Here, the participatory backcasting module explores the needs and functions aimed at the exploration of current and future system functions and societal needs to be fulfilled (Pereverza et al.). As previously mentioned, the why technique was used in order to identify the needs and functions of the selected area in the current and future situation, supported by Maslow's pyramid of needs.

The origin of Maslow's theory was a simple question: 'What motivates humans?' His theory proposes that all human activity is (directly or indirectly) motivated by innate needs, which can be physiological (such as the need for water and oxygen) or psychological (such as the need for love and independence)(Desmet and Fokkinga, 2020). In this sense, physiological and safety needs were identified as a starting point, such as nutrition, reproduction, a safe family environment, steady employment, transport alternatives, a safe neighbourhood, and a stable financial situation.

In particular, a lack of transport opportunities has been shown to be a barrier to accessibility and social inclusion in contemporary society. In rural and sparsely populated areas, access to public transport is often poor compared to urban areas, leading to fewer possibilities to participate in normal relationships and activities among rural dwellers (Berg and Ihlström, 2019).

The next aspect considered the social needs for belonging, love and affection. It includes not only relationships with friends, romantic partners, and families; but also involvement in communities and social or religious groups. For instance, human beings are exquisitely sensitive to cues of social rejection, and they respond to such cues using some of the same neural circuits used to register physical pain (Kenrick et al., 2010)

Additionally, functions of the current and future systems were considered in order to fulfil the identified needs.

- Food security and Health services: having access to the possibility of nurturing yourself and your family, as well as to a health structure that guarantees the illness treatment.
- Mobility: ability to change your spatial location in an affordable and independent way in order to fulfill other needs (Berg and Ihlström, 2019).
- Housing: warranty of an environment and conditions to keep you safe from harm and threats, rather than feeling that the world is dangerous, risky or a place of uncertainty (Desmet and Fokkinga, 2020).
- Recreation and community services: having warm, mutual, trusting relationships with people who you care about, rather than feeling isolated or unable to make personal connections. In addition to being part of and accepted by a social group or entity that is important to you, rather than feeling you do not belong anywhere and have no social structure to rely on (ibid.).
- Job availability and diversity: Being able to be economically independent, with a stable financial situation, leading to a sense of autonomy and freedom; in combination with the ability to exercise your skills to master challenges (Berg and Ihlström, 2019).
- Sustainability and environmental concern: the system needs to be aligned with the Municipality's commitment to the initiative 'Climate Neutral Cities 2030' within Viable Cities innovation programme.
- Comfort: Having an easy, simple, relaxing life, rather than experiencing strain, difficulty or overstimulation, an essential characteristic of the rural areasDesmet and Fokkinga, 2020

3.6 Future vision

The future vision is a description of the desired future (Pereverza et al., 2017). As system transformations are long-term orientated, the vision gives the process guidance and orientation (Pereverza, 2019). It is used to communicate the final goal so developed scenarios steer in the desired pathway. Towards 2050, plenty of things will change. As mentioned previously, recently the rural area is experiencing popularity, followed by population growth. Therefore, we need to adjust the rural environment to the new needs of the involved actors. This is crucial, so the area does not experience a decline of population again.[2]

The adjustments must be in harmony with the characteristics of the rural area. This is important because the region holds protected nature reserves (environmental sustainability).

[2]Which results in declining property prices, abandoned houses, the loneliness of residents, overpopulated cities with rising rent/house prices

In fact, from the questionnaire sent out, the authors observed that the main reason the people under study would move to the rural area is the nature offer. Thus, obtaining environmental sustainability can lead to more social sustainability. But it is also needed to ensure economic sustainability. One reason for growing urbanization are job opportunities[3] (Henderson, 2002). Derived from that observation, the desired future of rural areas should provide means to combine the rural lifestyle with financial security, as well as opportunities to obtain self-development on a carrier level. This is also backed by the result of the questionnaire. People, here young adults, rated employment as their main concern in rural areas, as well as the second highest importance[4] as a reason to move into the countryside.

Derived from the stated background, the desired future vision is formulated as the following:

"Rural Areas of Skellefteå: A sustainable place to live, work and stay."

With our vision, we want to ensure that the rural areas are steered in a way to face the upcoming challenges without losing its character. A place where people can fulfill their evolving needs of a constantly changing world, while living in synergy with nature life.

3.7 Criteria

The criteria were chosen with inspiration from the concept of smart villages. The concept of smart villages is "The participation of local people in improving their economic, social or environmental conditions, cooperation with other communities, social innovation and the development of smart village strategies" (Martinez Juan and McEldowney, 2021). Furthermore, it fits well because criteria have to provide full coverage over social, economic and environmental dimensions and preferably it should also be tickable and quantifiable. In order to compile the relevant criteria for this project firstly, ideas were generated for possible criteria. Secondly, the ideas were clustered and classified in order to compile the dimensions for each criterion. Thirdly, the criteria were prioritized based on the data collection and the list of final criteria for future stages was chosen. Lastly, the measurement methods for each criterion was elaborated on to make sure that the criteria were checked (Pereverza, 2019). It is also possible to set sub-criteria for the criteria. Based on the time frame for this project that was not possible to do. The final set of criteria was:

Social connectivity: Being close and connected to the people around you.

Environmental friendly: Living sustainably and having a low negative environmental impact.

Accessibility: Having access to transportation and being able to travel necessary distances in a comfortable way.

Affordability: Making sure that there is a variety of options so that more people than one income group can live in the rural areas.

Digital friendly: Having wider access to digital services.

Nature connectivity: Being connected to the nature around you.

Nature conservation: Keeping nature resilient and not turning the rural areas into urban

[3]When there is no expanding employment (Henderson, 2002)

[4]after "nature"

area.

3.8 Driver analysis

In the Figure 4, the driver forces that will mark the future in relation to the chosen system are placed in the impact-uncertainty analysis. The impact and the level of uncertainty of each driving force were identified and positioned regarding the perception of their influence. Drivers with high impact and high uncertainty are the key uncertainties, while drivers with high impact and low uncertainty are considered the trends.

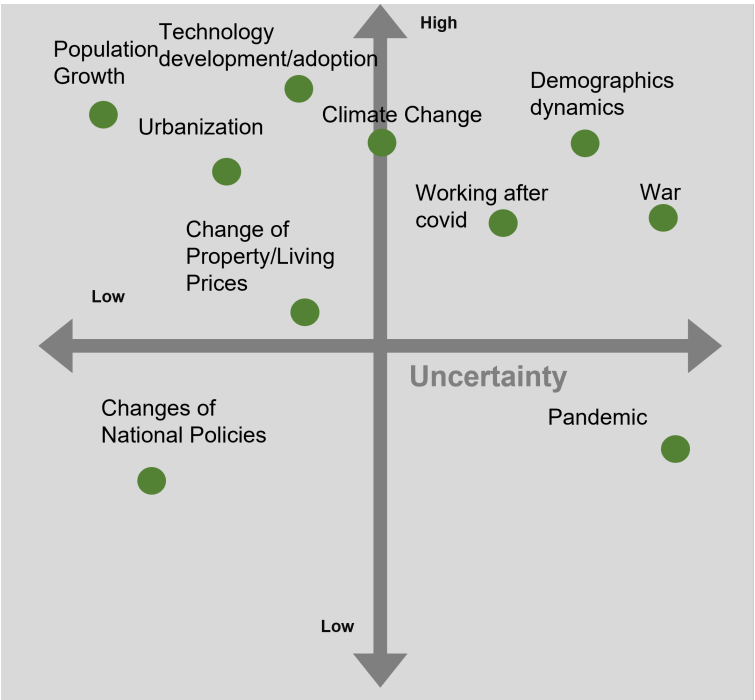


Figure 4: External Drivers

In order to develop the external futures, two independent elements out of the total of key uncertainties and trends were selected. Through the brainstorming technique and consensus decision among the authors of the current report, the authors selected as a criteria the independence and between the drivers and repercussion in the mentioned future vision:

- Technology adoption: degree of acceptance, integration and utilization of an innovation or product in the technological field.
- Demographic Dynamics: degree of heterogeneity of the population regarding sex, density, age structure, mortality and birth.

  The development of the external scenarios are show in the figure 5:

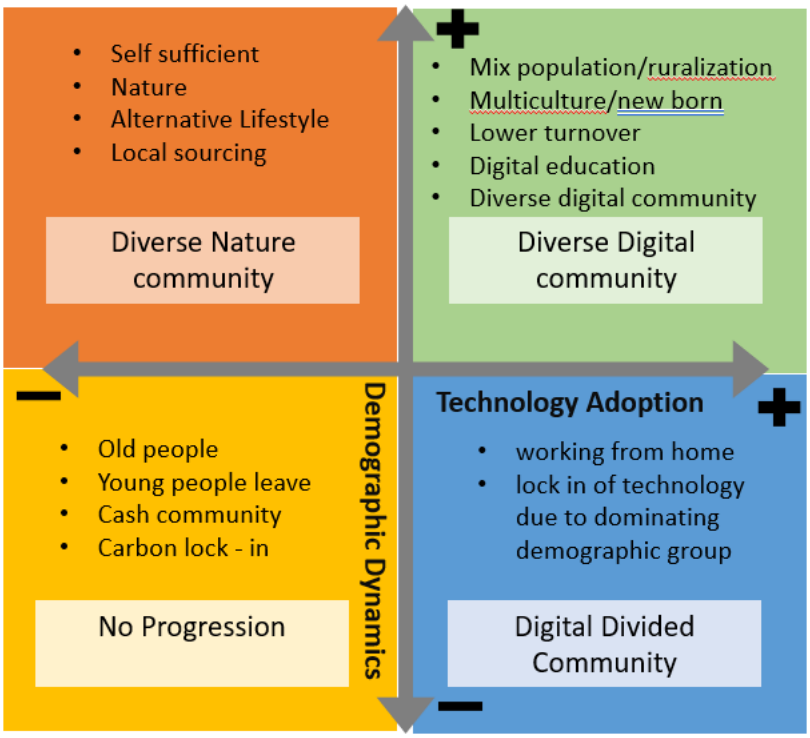


Figure 5: Future - External Scenarios

As a first scenario characterized by low demographic dynamics and low technology adoption, is considered "No progression" where the community is mainly formed by old people and there are no opportunities for young people who decide to move or take another place as an option. There is also a carbon lock-in that places the community in a disadvantageous position.

On the other hand, high technology adoption and high demographics dynamics concluded in a "Diverse Digital Community where multicultural population with high rate of births adopt the technology and the rural conditions minimizing the turnover from the location.

The intermediate scenario is called "Diverse Nature Community" where there is an alternative lifestyle and sense of self-sufficiency focused on nature and local sourcing is the main focus with a low technology acceptance.

Lastly, "Digital Divided Community" is characterized by lock-in of technology in a dominating demographic group, leading to inequality in the opportunities.

3.9 Internal scenarios / solutions

This section aims to create and select internal scenarios for further in-depth analysis. The authors use the morphological method suggested by Pereverza et al. (2017). Here, the scholars provide an adjusted form of the method for participatory backcasting, derived from different earlier academic studies.[5] This report follows the suggested structure. According to the scholars, it identifies internal scenarios based on socio-technical dimensions of a system. This helps to simplify the high complexity of the system and to establish "outside-the-box" solutions.

The suggested method structure includes five iterative steps, which will be discussed in the following subsections:

1. Identification of the system dimensions
2. Identification of the "extreme" states for each dimension
3. Creation of a morphological table and development of a morphological basis
4. Exclusion of inconsistent scenarios
5. Selection of scenarios for further in-depth analysis

3.9.1 Identification of the system dimensions

First, dimensions of the socio-technical system (the rural area of Skellefteå) are identified. In this context, dimensions are qualitative or quantitative characteristics of the system (Pereverza et al., 2017). The group decided to limit the number of dimensions to seven, in order to stay within the scope of the project and limit the system complexity. Therefore, the following dimensions are identified:

1. Community Space
2. Circular Neighborhood
3. Variety of Transportation
4. Housing Opportunities
5. Digital Services
6. Recreation Opportunities
7. Build Environment

The mentioned dimensions address characteristics of "living". First, the configuration of community spaces and a circular neighborhood defines how actors within an area interact with each other. It addresses the social component of "living".

Secondly, the variety of transportation, housing opportunities, and digital services characterizes the fulfillment of needs like mobility, housing, comfort, and job opportunities.[6] It answers the following questions: How do actors move between places? In with housing environment do the actors live? Are certain technologies used to substitute specific traditional

[5] For example Zwicky (1948)

[6] See section 3.5

services? With these dimensions, a combination of social, economic, but also environmental components of "living" are addressed.

Lastly, recreation opportunities and the built environment address the environmental components of "living".[7] As stated earlier, the rural area is characterized by its nature. As seen from the questionnaire, nature is ranked as the most important reason to move into countryside. Therefore, it has high importance how this dimension is structured. It answers questions like: How can actors interact with nature? To which extent should the current area be developed (land use)?[8]

3.9.2 Identification of the "extreme" states for each dimension

This step identifies extreme scenarios of the presented dimensions. They are used to establish scenarios within the morphological table in the upcoming steps. In the following, the authors will address each dimension and its extreme states shortly.

Community space can be offered in many ways. Thus, naming types of possible community spaces would exceed the scope of the dimension. Based on that, the extreme states are simply the extent of qualitative and quantitative community spaces provided by the municipality: *none, medium, high.*

A community on a countryside has many opportunities to be self-sufficient, due to its variety and a short distance to agriculture. For example, buying locally or providing goods on your own property[9] can be more environmentallly friendly, but it could also lead to less convenience[10]. Therefore, the extreme states address these scenarios, by stating the good supply circumstances: *privately owned, mixed, circular, imported.*

For the transportation dimension, the ownership of the vehicle plays a big role. Privately owned cars are very convenient but environmentally harmful and expensive. Therefore, alternatives are explored, which are stated in the following extreme states: *privately owned, public transport, and transport pool*[11].

There are many accommodation alternatives. Our goal is to evaluate different means of living. These means come with advantages and disadvantages, like comfort, space/land use, and privacy. The authors identified *traditional country houses, tiny houses, and co-living* as promising alternatives regarding the future vision.

Nowadays, digitization automates services in many sectors, which can enhance accessibility. Especially the rural area can profit from this, as it has often large distances to overcome. Therefore, the extreme states are identified as *low, medium, and high.* These states represent the grade of substitution of traditional services, for example health care[12], with digital solutions.

As mentioned before, the rural area offers many recreation opportunities. The extreme

[7] Also social components, like mental health and interactions with nature.

[8] Trade-off/Dilemma between: developing land, which fulfills needs and functions, or untouched land, which also fulfills needs and functions.

[9] For example: growing food, water supply, Building own furniture, etc..

[10] For example: shorter opening hours, not every good is available, etc.

[11] A mixture of different transportation means.

[12] A concerning need in rural areas (see section 3.5, as distances to hospitals are larger and the doctor density is lower compared to urban areas.

states evaluate the accessibility, maintenance, and development of new recreation opportunities for actors within the area. The states are defined as *low, medium, and high.*

Finally, the built environment extreme states characterize the "picture" of the area. The area can be developed to a more *urban area* approach or a *nature focus* approach. Also a *mix* of both states is possible.

Table 2: Dimensions and extreme scenarios

Dimension				
Community Spaces	None	Medium	High	
Circular Neighborhood	Privately owned	Mixed	Circular	Imported
Variety of Transportation	Privately Owned	Public Transport	Transport Pool	
Housing opportunities	Traditional country house	Tiny House	Co-Living	
Digital services	Low	Medium	High	
Recreation Opportunities	Low	Medium	High	
Build environment	Nature Focus	Mixed	Urban Area	

3.9.3 Creation of a morphological table and development of a morphological basis

From Table 2, it can be observed that there are 3 x 4 x 3 x 3 x 3 x 3 x 3 combinations possible among the states and dimensions. Therefore, the morphological basis is formed by 2916 combinations. As analyzing each scenario is out of scope, the group formed 10 scenarios. [13]

3.9.4 Exclusion of inconsistent scenarios

The morphological table seen in Table 3 represents plausible combinations of the extreme states. These combinations form inner scenarios, which can be evaluated regarding the set vision. Five scenarios were excluded due to inconsistencies. For example, one scenario put recreation opportunities on a *low* state but rated the build environment *nature focused*. The group decided that this is not plausible, as a nature focus would apply at least *medium* recreation opportunities.[14]

[13] Two each member, without overlaps.
[14] Numerous outdoor activities.

Table 3: Consistent scenarios

Scenario	*Community Spaces*	*Circular Neighborhood*	*Variety of Transportation*	*Housing opportunities*	*Digital services*	*Recreation Opportunities*	*Build environment*
Community engaging	High	Circular	Transport pool/public transport	Co-living	Mixed	Mixed	Mixed
Nature focused	Mixed	Circular	Transport pool	Tiny houses / Co-living	High	High	Nature
Smart and sustainable	Mixed	Circular	Transport pool	Tiny houses / Co-living	High	High	Mixed
Urbanizing it	High	Mixed	Privately owned/public transport	Business as usual	Mixed	Low	Urban
Current state	Low	Privately owned	Privately owned	Business as usual	Mixed	High	Mixed

3.9.5 Selection of scenarios for further in-depth analysis

From the listed five scenarios shown in Table 3 only three scenarios were selected to be further analyzed. The decision was based on consistency with the future vision. Here, the scenarios *Urbanizing it* and *Current State* are in conflict to our desired future.

First, *Urbanizing it* suggests turning the environment into a more urban approach. On one hand, we get high community engagements, but the nature followed by its recreation opportunities are lost. The area would lose its rural character, which is not desired as stated in previous sections.

Secondly, the *Current State* scenario describes an environment without any change. Therefore, the challenges presented in earlier sections [15] cannot be addressed.

Thus, as seen in table 4 only *Community engaging*, *Nature focused*, and *Smart and sustainable* remain as possible inner scenarios. All three scenarios are discussed briefly in the following.

The *Community engaging* scenario focuses on social engagement. Here, the area must provide opportunities for the citizens to interact with each other. But, this comes to the cost of engagement with nature and digitized services.[16]

In the *Nature focused* scenario the outdoor conservation cones with the costs of Community spaces. More "untouched" nature can hinder the development of community spaces.[17] In addition, local services are replaced by digital solutions, to reduce land use and kilometers driven by cars.

The last scenario, *Smart and sustainable*, represents a mix out of the first two scenarios. Here, it is tried to find a mix between untouched nature and social engagement. The approach is technology-driven, but without neglecting the human factor.

[15] see section 3.3 and 3.5.
[16] Personal contact.
[17] social engagement needs to be analyzed.

Table 4: Scenarios for in-depth analysis

Scenario	*Community Spaces*	*Circular Neighborhood*	*Variety of Transportation*	*Housing opportunities*	*Digital services*	*Recreation Opportunities*	*Build environment*
Community engaging	High	Circular	Transport pool/public transport	Co-living	Mixed	Mixed	Mixed
Nature focused	Mixed	Circular	Transport pool	Tiny houses / Co-living	High	High	Nature
Smart and sustainable	Mixed	Circular	Transport pool	Tiny houses / Co-living	High	High	Mixed

3.10 Solution testing

The goal with using solution testing is to test which scenario would be the best final outcome possible for implementation (Pereverza, 2019).

3.10.1 Criteria testing

All the internal scenarios (solutions) should be evaluated against each of the criteria, in order to find which solution is best fitted according to it. For the criteria to be prioritized and weighted a questionnaire was sent out targeting young people focusing on what would be most important for them to live in a rural area (See appendix 1). This was then compiled together with the residents dialogue. Based on the data collected from the questionnaire jobs and medical services, nature connectivity, environmental friendly, digital services and social connectivity were the most important ones. Based on the combined data collection and consensus within the group nature connectivity, environmental friendly, digital services, and social connectivity ended up being the highest weighted criterion. A multi-criteria decision analysis (MCDA) was performed in order to indicate the performance level of each of the solutions.

Table 5: Multicriteria Decision Analysis (MCDA) - Weights

weight %	*Criteria*	*A Community engaging*	*B Nature focused*	*C Smart and sustainable*
17	Social connectivity	5	3	4
17	Environmental friendly	4	5	5
12	Accessibility	4	1	4
10	Affordability	5	4	4
17	Digital friendly	3	5	5
17	Nature connectivity	3	5	5
10	Nature conservation	3	5	4
100%	TOTAL (max. 35)	27	28	31
	Weighted average	3,83	4,08	4,51

Looking at Table 5 it can be seen that the highest weighted solution using an MCDA was the smart and sustainable one.

3.10.2 Robustness testing

A robustness testing evaluates if a strategy can cope well with variations. The test helps to identify robust solutions, their vulnerabilities and evaluate the trade-offs between them. Each of the chosen scenarios was tested against the four created external futures. Together with the scenario testing against their criteria, it is possible to see the strengths and weaknesses of the suggested solutions (Pereverza, 2019). By using the model for robustness testing it is possible to identify a robust plan that can perform well under a variety of possible futures and circumstances. Different solutions can decide if a possible solution is successful or fail and therefore it is important to do significant testing to eliminate unnecessary risks (Malekpour, Haan, and Brown, 2016).

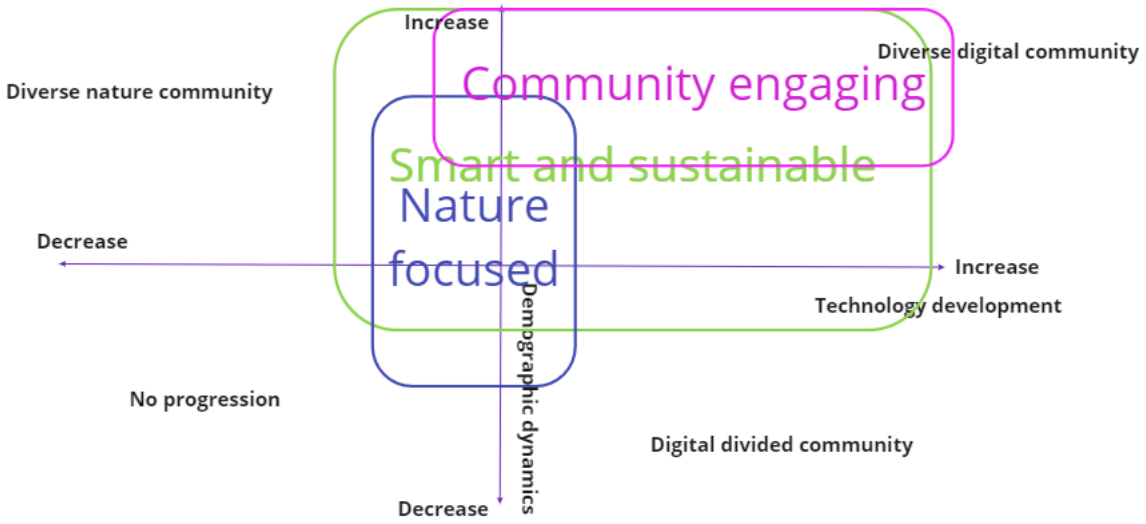


Figure 6: Robustness Testing

The robustness testing displayed in Figure 5, shows that the scenario called smart and sustainable is the most robust option, meaning that it supposedly performs best under a variety of future compared to the other scenarios. The conclusion was drawn from consensus building and brainstorming within the group. The nature-focused solution was set to perform best in the future for diverse nature communities and the future where there is no progression. The reason was that The community engaging scenario was set to perform best in the diverse digital community and second the diverse nature community.

3.11 Final combined scenario for implementation

"Smart and Sustainable" is the final combined scenario selected for implementation. This scenario sets an ambitious paradigm for rural development, one that entails systemic shifts in how the built environment integrates nature to address current and future rural development challenges in Skellefteå.

The evidence presented in this report indicates the feasibility of the scenario in providing

for the needs of a growing population and applying novel technologies while conserving the natural habitats of Skellefteå. A set of smart and sustainable solutions can provide greater value among all the scenarios evaluated through a multicriteria decision analysis, as shown in Table 5.

The proposed solution considers the availability of rural community spaces as a form to enhance citizen engagement. Community infrastructures, such as libraries, community centers, and community farms, form a network of resource centers throughout the rural area. Also, circular neighborhoods are part of the proposal to give a new meaning to the sense of a neighbourhood. In this case, the solution combines seeing nature and the care for natural resources as an inseparable part of ruralization on the one hand, and conceptualizing neighbourhoods as 'ecosystems' and 'habitats' on the other. In addition, the solution also contemplates different modes of transport. In this case, the priority is the sharing economy represented by sharing personal electric vehicles or sharing other transport options such as bikes. It can also be new options of public transport, helping to alleviate the need for personal car ownership.

In terms of housing opportunities, the combined scenario proposes a variety of options from individual houses to co-living spaces. All models are affordable and inclusive. The driving force behind digitalization enables the access information and services. From health care to Municipal services. The access to various recreation opportunities is visualized as a rural area where is easy to visit the mountains and forests, whether to hike, to swim, or simply just to be there. Finally, the selected scenario proposes a built environment that cultivates a nature-positive city. Thus, circular economy principles and design for-carbon-neutrality are incorporated in all new buildings and neighborhoods.

According to the authors, among all internal scenarios, this particular configuration is more likely to provide a greater value. To capture the opportunities presented by the combined scenario and realize the proposed vision for Skellefteå, however, major barriers must be faced. For instance, the solutions must fit the complexity of rural challenges derived from a growing population with dynamic demographics. They also have to face a changing climate that calls for the implementation of sustainable technologies. Both challenges, addressed on the robustness test, are necessary for guaranteeing a built environment, social structure and natural capital co-existing in harmony.

The combined scenario must be accompanied by a pathway that takes these insights and translates them into a feasible roadmap for a "smart and sustainable" rural transformation. The level of ambition of the following pathway matches the aim and objectives of the "Climate-neutral Cities" programme and seeks to systematically incorporate the value of nature into society's culture, technology, and governance and regulation, and thus reorientate rural planning and open new markets so that they reflect the true cost of nature.

3.12 Pathway for implementation of the final combined scenario

For the pathway, four different steps were followed in order to elaborate on the changes required to achieve the desired future and vision. First, the identification of necessary changes divided by types and develop a list. Second, the alignment of the stakeholders previously analyzed to the initialization/implementation/facilitation of the changes. Third, the placement of changes on the timeline from the future to the present day with a milestone in 2030. Lastly, the identification of barriers and drivers for the implementation of each change (Pereverza, 2019).

The changes were categorized into three different components, structural/institutional, cultural and technological changes. Structural/institutional changes stand for the innovation in policies and regulations. Cultural changes relate to normative, behavioural and value changes. Technology changes include low-and-zero carbon technologies and concepts implemented, low-energy buildings, sustainable mobility, the circular economy and local energy production applied (Pereverza, 2019). Looking at Table 6 the changes are formulated as specific achievements of what is hopefully achieved in that year. Skellefteå has already established a development plan and vision for 2030 (Skelleftea, 2015). The pathway to 2030 integrates the ideas from Skellefteå of reaching climate neutrality and their set vision for the municipality in general with the proposed vision for the rural areas.

Table 6: Pathway Development

Changes/ Stages	*Cultural*	*Technology*	*Structural/Institutional*
1st Stage (2022)	Educational events about sustainable living Citizen engagement events Dialog with municipality	Feasibility study: -Mobility -Digital e-services -New building approaches -Decentralized power generation	Subsides for renewables Promotion of new building scenarios Secured funding for future investments Identification of barriers for hybrid work Identification of best practices Expand accelerator programs Collaboration with other rural municipalities inside Sweden
2nd Stage (2030)	Sustainability as first priority Development of community hubs Encourage the sense of belongingness Enhanced citizen engagement in municipality decision-making Carbon-neutral rural lifestyle	Digitalization of services and products Carbon-neutral Expand charging infrastructure Available high-speed internet	Collaboration with other rural municipalities outside Sweden Flexible/agile municipal decision making
End game (2050)	Sharing economy Performance economy Established opportunities for all demographic groups Zero Waste	Interconnected living Positive energy housing and business Democratization of the internet Zero waste	Participatory governance from citizens to stakeholders

Three phases can be identified:

- A starting point from 2022 to 2024

The first phase focuses on engaging with the citizens, determining the feasibility of changes and expanding the existing ideas from Skellefteå. From a cultural perspective, the changes require the involvement of the current and future citizens to ensure Skellefteå attracts people from the outside but also makes people want to stay. Citizen involvement can also be an opportunity to overcome the reluctance of change from citizens. Therefore, the starting point is the launch of citizen engagement strategies and participatory movements. Similarly, events for local, regional, national stakeholders can promote the emergence of niches in the transition to climate neutrality.

For the structural changes, it is important to secure the funding for upcoming projects. Here, the municipality and the government must develop initiatives to evaluate new sources of funding from outside Skellefteå. Furthermore, it is important to identify the barriers for hybrid work, identify the current best practices and increase the collaboration between the rural areas and other municipalities in Sweden facing the same issues. Together with the private companies, the municipality can visualize policy innovations to promote hybrid work. Finally, a required

change is the expansion of the current accelerator program to attract even more newcomers and small and medium-sized businesses to Skellefteå.

From the technological view, the first phase considers the investigation of possible expansions of digital services since Skellefteå Municipality has already advanced in this field. Here, there is a need to involve stakeholders such as construction, transport, telecommunications and energy companies to evaluate how everyone can contribute. Digitisation has the potential to be a tremendous driver of change if it is tailored to the needs of rural communities and executed with their input. We can ease some residents' work by getting most of the necessary services mentioned in our follow-ups digitalized. Another essential feature of PB in terms of planning is its emphasis on needs and services rather than supporting a particular technology and the localisation of aims and priorities by letting local stakeholders define them. Also, with the help of certain digitalization facilities, the residents would get a sense of closeness towards the municipality.

- A second phase from 2024 to 2030

Skellefteå has set a milestone of being a climate-neutral municipality by 2030. Cultural changes focus on having sustainability as a priority and lowering negative environmental impact from the citizens since they are an important part of the municipality to stay climate-neutral. Therefore, it is also important to enhance the citizen's engagement in the decision making so they are involved in Skellefteå having a low environmental footprint.

Regarding the technological changes, the second phase includes a successful dissemination of low-carbon technology to lower the environmental footprint and be climate-neutral. For example, strategies like providing high-speed internet to more rural areas to decrease traveling or increasing the charging infrastructure to facilitate a change towards electric vehicles. Here, it is important to engage with the companies in the municipality to ensure that there is an adequate amount of charging poles in the case of electric car diffusion.

Structural changes in 2030 are related to collaborating with other municipalities outside Sweden. As one of the 100 climate-neutral cities, Skellefteå will have a lot of viable insights and learned lessons to be implemented in other regions.

- A third phase from 2030 to 2050

The third phase is the end-goal for the vision. Regarding the cultural aspect, there is a hope for a system change where there is no longer a linear economy and instead, the base is a sharing/performance economy and move towards a zero-waste lifestyle. With the established goal of attracting more diversity to Skellefteå municipality in 2050, the change is based on establishing opportunities for all demographic groups.

From a technological structure, the change focuses on having an interconnected living. This includes positive energy houses and businesses, while promoting the democratization of the internet.

The institutional structure contemplates the goal of promoting a participatory governance from citizens to stakeholders. Reaching the end-goal is a task in which all stakeholders must be involved. For instance, attracting diverse demographic groups. As a result, the municipality and citizens play a key role in welcoming visitors, newcomers and companies as they contribute increasing the living standards and create job opportunities.

3.13 Follow-ups

Based on the final combined scenario for implementation and in agreement with the pathway proposed, the following experimental ideas could serve as pilots to accomplish the vision "Rural areas of Skellefteå, a sustainable place to live work and stay". As seen in Figure 7, the experiments are initially created to initialize specific states from the internal scenario. But as illustrated, a created experiment can have affects on multiple dimensions. Each of the suggested experiments is discussed in the following and explained in their complex interconnection with other dimensions.

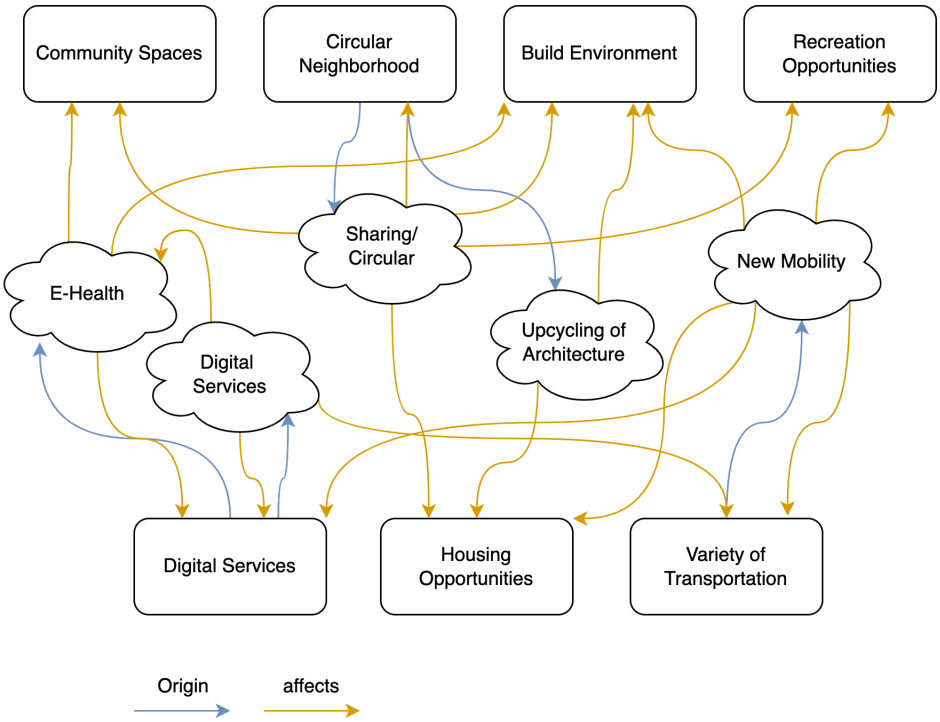


Figure 7: Process and Interconnectivity of Experiments

3.13.1 Upcycling of Architecture

Upcycling a product, material, or residue implies improving its quality and value above its initial state. The building sector generates about 40 percent of all trash on the Earth, primarily from six materials: brick, concrete, steel, glass, wood, and plastic Kumbhani, n.d. According to Design Building Network, 2019, the construction industry contributes roughly 40 percent of annual power demand, including close to 30 percent of all energy-related greenhouse gas emissions, according to the United Nations Environment Program Sustainable Buildings and Climate Initiative.

Upcycling method would thus help in giving a new purpose to the building. Most of the materials used in the construction of the building can be reused. To get started with the approach, the community needs to operate an initial inventory for the abandoned houses in the area. This can be a challenge, as SVT NYTETER (2020) states, an estimate of 200,000 houses are not classified or lived in. Therefore, the experiment has it origin in the circular environment. Yet it also redefines land use which has a positive effect on the desired build environment and housing opportunities.

3.13.2 New mobility

For the situations of participatory strategic planning procedures to achieve, the design of the mPB framework and its execution another experiment is to test people's attitude towards new mobility solutions. Framework flexibility is particularly critical for long-term development (Pereverza, 2019), Which would identify mixed transport concepts that could be adapted according to the rural environment of Skellefteå such as as polls about solutions which could be implemented in the neighbourhood.

New mobility opportunities are explored to investigate the variety of transportation. But it also affects the building environment as mobility infrastructure can shape landscapes. Furthermore, mobility is closely linked with accessibility which can affect housing opportunities, for example in less reachable areas.

3.13.3 Digital services

As the rural areas provide lower density in community services, it opens opportunities for digital solutions. For this first analysis, citizens' willingness for specific services to be digital, needs to be stabilized. Another key characteristic of PB in terms of planning is its focus on requirements and services rather than pushing a specific technology, as well as the local contextualization of goals and objectives by allowing local stakeholders to define them (ibid.). With the help of user interface and screentime the system would evaluate polls. Hence, selecting pilots in order towards follow-ups.

As this experiment explores digital services it can affect many other dimensions, like the variety in transportation by providing car-sharing solutions or innovative route planning. Also, other experiments can be affected directly, like E-Health solutions which are presented in the following.

3.13.4 E-Health

A move toward participatory governance and reflexive planning methodologies is urgently needed to overcome these constraints and create effective plans for socio-technical transformations in the industry (ibid.). Providing services and solutions for risk groups digitally in order for better information-sharing within health and social care. Finding partnerships for healthcare provider to monitor the data of each citizen for their well-being.

Therefore, the E-Health services are a more narrow approach to implementing a digital environment. Next to the digital services also the build environment could be affected. The land use is restructured as more abandoned places can be explored with lower health risk concerns due to bad accessibility. The E-Health platform enables early detection and avoidance of possible risks, along with more efficient management of care delivery, particularly for people with chronic diseases, and the costs of medical unit resistance changes.

3.13.5 Sharing/Circular

In the recent trends of circular economy at a small scale, community financed cultivation/farming could be beneficial in many ways. The solution can also enhance social engagement. This by meeting neighbors and if you are new to the area it is an easy way to meet other locals with similar interests. The idea is also set to enhance biodiversity by growing flowers or crops suit-

able for pollinators. Furthermore, the garden can be a way of using land for the municipality that might not be suitable for other purposes while making an attractive landscape. Regarding finances for a communal garden initiative, there are different options possible. Some examples are: collective ownership, community shares, subsidies or sponsorship where other citizens can sponsor in return for crops or self-picking. The idea is also easily transferable to other areas where local citizens have high interest.

4 Discussions

In this section, reflections through each module from the implemented methodology modular participatory backcasting are made. Moreover, limitations and further recommendations are developed.

4.1 Reflections from each module and the entire process of the implemented PB project

To make a valuable reflection on the modules and process of mPB, the authors follow Olga Kordas suggestion[18] and only focus on five modules, the experiments, and the general process through the project. Thus, a more in-depth reflection can be given. Each part first states the challenges the group was facing and how it overcame those. Secondly, suggestions for future project executions.

4.1.1 Problem Definition

At the beginning of the project. the group was facing the most challenges here. The group was struggling to find a balance between narrowing down a topic without being too narrow. This nature may have evolved out of "narrow engineering thinking". In addition, in business and entrepreneurship courses we were tough to be as specific as possible. This also influenced our thinking. Furthermore, it was challenging to settle on a topic in general, because Skellefteå is in the north of Sweden. As an international group (incl. one Swedish person from Stockholm), it was difficult to evaluate the problems the area faces, as no one had personal information. The question which we took a long time to answer was: Is our problem actually a problem for Skellefteå rural areas?

To overcome these challenges the group relied on two approaches: Wide-literature review and use of Q&A session. For the first offered approach, the group members first searched individually on official sites, like documents offered by the municipality websites. Then, the document was translated to English and uploaded into the shared Google Drive. Each member had to contribute at least five sources. After all, documents were submitted, the literature was divided into "must reads"[19] and "additional information".[20] With this method the group got a better understanding of the situation and environment, as well as the problems they are facing. With that foundation, the Q&A sessions cleared up our last open questions.

To improve this part for future projects, we would suggest dividing the groups at the beginning into specific topics. With that, the group already has an idea of what to focus on. In

[18] From coaching session discussion.

[19] Each member has to read and analyze this source.

[20] The suggesting group member reads through it and summarizes the source in the next meeting.

addition, the presentation from Skellefteå could be more problem-orientated and maybe even suggest already specific challenges.

4.1.2 Future Vision

Similar to the problem orientation, the future vision was often affected and adjusted by changes made when earlier modules were re-visited. The vision developed over time: From "living in a sustainable building environments" over "living in a sustainable community" to "living in a sustainable rural community where you can fulfill your needs".[21] A suggestion for future projects would be to be broader at the beginning in the future vision, as the team will re-visit this step many times again. It was harder to change a narrow approach than iterative narrowing down a broad one over time.

4.1.3 Needs and Functions

This module required personal opinions and knowledge about the social environment of the system under study. Here the main two challenges were:

1. Is the need the group identified, as urban citizens, a need of a citizen in the rural areas?
2. Is the need described as current or future need?

The group overcame these challenges by going back to basic needs like "shelter" or "health". These needs were considered as universal needs and were a starting point to narrow down and reflect these on rural areas. The process can be observed on the whiteboard image in the appendix. For future projects, the group would suggest settling on three to five basic needs and narrowing down from there.

4.1.4 Driver analysis

The group had a very vital discussion in this module. It was challenging to evaluate the impact. Here the group often defaulted on: "Everything has an impact." This might be the case, as the analyzed system is highly complex. Therefore, the group did not what to underestimate certain things. For example, *working after Covid-19*. It is hard to predict the adaptations of the working environment and how it will influence the life in rural areas.

But also evaluating uncertainty became challenging. The group had an intense discussion about the driver *Climate Change*. Climate change might be certain, but the impact and forms of symptoms it would have on the rural area are speculative. This matter was becoming more clear when the seminar intensively discussed *black swan events*.

The group overcame the challenges by using three steps to settle on a decision: discussion, closing arguments, and voting. We would suggest in future works to implement decisions mechanisms to be more democratic and time-efficient.

4.1.5 Internal scenarios

Here the group was facing a high amount of possible combinations.[22] As mentioned in the report, the members were able to overcome this challenge by limiting the amount of scenario.

[21] The idea behind the vision (see section 3.6

[22] see section 3.9.

Each one proposed two scenarios. The following discussion established good results as common thinking was explored about what the future should **not** look like. This can be very valuable to narrow down the scenarios.

4.1.6 Experiments

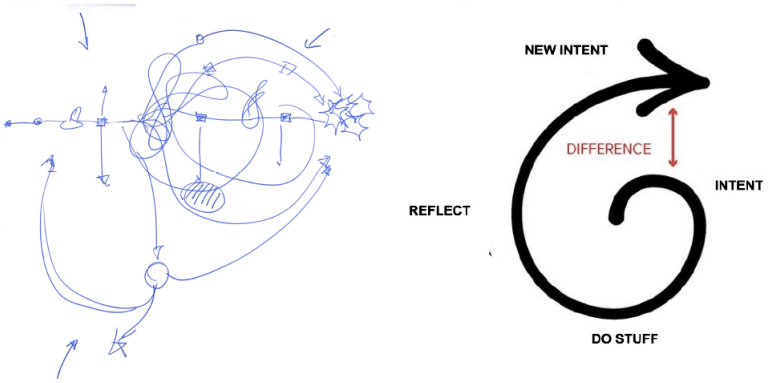
These stages tested the creativity of the group. The group had a viral discussion about possibilities and reflected on the results from previous modules. Concepts from other rural areas were explored and it was "satisfying" to see that some of our ideas had good experiences in other communities.

A challenge the team had to overcome was the degree of broadness. One feedback of the seminar regarding this module was that the experiments were too specific and should at least have two broader formulated ones. That is why we implemented a mix between specific and wider experiments. A suggestion for future projects would be to create a linked tree of a mind map or illustrated and moderate from wide topics/sectors to very narrow actions. The group experienced good practice with that method.

4.1.7 General Approach

The main two challenges the group faced with mPB were the agile and abstract environment of the methodology, as well as dealing with Swedish literature.

Figure 8: mPB environment (lecture slides)



As seen in figure 8 the mPB environment is changing constantly. This is exactly what the group was experiencing. While moving forward to the process, modules needed to be re-visited many times. Especially the problem orientation, as mentioned before, was affected many times. After re-visiting an earlier module, each module after it needed to be revisited too, in order to sustain consistency. Here, the vision was a crucial part as well as mentioned before. Therefore, the project group should not underestimate the complexity of the methodology and implement agile project management principles, as seen in section 6.

Next to the agility, the abstract environment was a challenge to overcome. Often, the group needed to "step back" and review the made results and assumptions on a higher level. A well-structured vision helped to do this review. Questions like: Is this scenario still aligned with our vision? What consequences would this change have on our main approach? The group would suggest for future projects to first establish a broad vision and narrow it down over the whole

project, as suggested in subsection 4.1.2. This allows evaluating each change made on a meta level.

Finally, the language barrier was a challenge to overcome. Literature provided on websites is almost exclusively in Swedish. This was a problem, as four out of five team members do not speak the language. Making simple web-searches became very time-consuming, as keywords for those searches could only be provided in English, but the content of the source is in Swedish. To deal with this issue, we used Google Chrome as the default browser, as it has a live translator integrated. Also, documents can be translated on websites as a whole. In addition, it is recommended to share as many sources as possible where multiple useful documents can be found. For example, it was challenging to find the location of the in-depth analysis for rural areas in Skellefteå[23], but from there many new sources were explored.

4.2 Limitations and recommendations for further exploration

One of the relevant limitations elaborating of the project was the time given to develop the modular participatory backcasting methodology. Each module requires sufficient time to support the decision making and the analysis with trustful sources. Moreover, adapting the thinking process to the current situation, creating a vision, and reviewing the feasibility of the final combined scenario demands more time than first expected.

Data collection represented another limitation. A major quantity of stakeholders could have been reached with more time available. Although the stakeholder analysis is the fourth step of the mPB framework, the orientation problem was subject of modifications during the process, affecting the analysis on the successive modules including weighing the power and interest of the relevant stakeholders. Therefore, this situation affected the data collection strategy proposed in the beginning.

When innovating systems, it is imperative to support every decision with data to guarantee the correct identification of needs. Although the results were supported by data collected from the current residents, future residents and the Municipality of Skellefteå, the data analysis served more as a validation than as an input for the decision-making.

Among the recommendations for further exploration is the diversification of information from other stakeholders involved in the rural transformation of Skellefteå. New configurations of the socio-technical system can be analyzed following the selected criteria and dimensions if data from construction, transport, energy and telecommunication companies, or small and medium-size businesses were collected. This is a determinant factor for the feasibility and robustness of new potential solutions.

Another relevant suggestion is a more depth analysis of possible new experiments related to mobility, food systems, waste management solutions, or nature-based water supply. Similarly, a bench-marking exercise with other municipalities will serve as an inspiration for best practices. Lastly, establishing an action plan for the implementation, combined with selective monitoring indicators to evaluate the strategy's performance in the short, medium and long-term.

[23](Skellefteå Kommun, 2018a)

5 Conclusion

The development of the analysis was based on the modular participatory backcasting methodology focusing on the rural development of Skellefteå, as one of the crucial components in contributing to sustainability and innovation.

In this sense, a vision for the rural areas by 2050 was proposed: "A sustainable place to live, work and stay", where the rural areas are steered in a way to face the up coming challenges without losing its character. A place where people can fulfill their evolving needs in a constantly changing world, while living in synergy with nature life.

A novel configuration of the socio-technical system for the rural development of Skellefteå is proposed: a smart and sustainable community was the combined scenario reached by the methodology in alignment with our vision "Rural Areas of Skellefteå: A sustainable place to live, work and stay". The main objective of this solution is to ensure that rural areas evolve in a way that enables the path to face upcoming challenges characterized by complexity and acceleration without losing its original sense. People can satisfy their evolving needs living in synergy with nature and supported by digital services, a new way of transport such an integrated public transport and carpooling, a strong sense of engaging communities and sustainability.

Lastly, a clear pathway divided into three temporal milestones was developed in order to create the basis for a successful and viable transition towards the created combined scenario, complemented with five different pilots that could help in the development of our proposed vision.

6 Teamwork Organisation

This section gives a brief overview of the project management approach the group followed. It describes documentation, communication, and work distribution methodology. The initial goal was to create an agile environment where people can contribute opinions, efficiently work on the project, and earlier work can be re-visited and adjusted.

To begin with, three main values were set at the beginning to guide the project and select approaches: Time efficiency, reliability, and quality. These values are important, as the project duration is set very short but comes with high complexity in research and discussions.[24] But the time efficiency work should not be a trade-off for quality. Furthermore, without reliability, the project cannot move forward and trust, as well as respect towards the work of each other is harmed.

First, the documentation was done by using Miro as the main tool (see Appendix 3). Also, a Google drive was created to store important documents and share relevant literature. After the held seminars, the group revisited the steps of the mPB methodology. Here, the provided graphics were copied and "re-discussed" by the group with high detail. This often led to re-visiting earlier steps, like the future vision, to adjust the outcomes in a consistent way. For the questionnaire, a Google Form was created. Most people are already familiar with it and it analyses the input automatically. This saves time and lowers the technical barriers for people under study. For the report LatTex was used using Overleaf.com as a collaborative editor. This allows working simultaneously and with supported formatting.

[24] Which includes many opinions.

A hybrid model was chosen for the group communication. Therefore, meetings were held in person and digitally. Short announcement and meeting scheduling were done though WhatsApp Messenger. Moreover, at the beginning, the seminars were held individually online. But the approach was switched within the middle of the course where the group came together in seminars to discuss the topics in-person, instead of breakout rooms provided by Zoom. This approach enhanced the productivity, creativity, as well as group dynamic significantly. Thus, all upcoming seminars were held in this way. The mentioned follow-up meetings were also switched to in person meetings. Here, we used a physical whiteboard to document our ideas (See appendix 3). This resulted in a significant boost in dynamic and discussion. The final results were digitally documented in Miro to be reviewed later (See appendix 4) .

The work distribution was separated in a hybrid model as well. Here, every member did research on the upcoming seminar and contributed it at the group meetings. Also, fundamental literature, like the in-depth analysis about Skellefteå Rural area (Skellefteå Kommun, 2018a), was published on WhatsApp as a mandatory reading. This was essential, so that every group member keeps up with the topic and can contribute qualitative input. The topics for the report were all discussed and documented in the previous group meetings. Therefore, the work could be distributed. People mentioned favorable parts to work on. After writing individually, each work was revised, discussed, and corrected together in the group. Also, concerns and questions were mentioned and solved together.

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A Appendix 1

Moving to a rural area

* Required

1. How old are you? *

Mark only one oval.

- ◯ 18-24
- ◯ 25-30
- ◯ 31-36
- ◯ Other: _____

2. If you would live in a rural area what would be important for you? Pick the three most important. *

Check all that apply.

- [ ] Recreation opportunities
- [ ] Social engagement
- [ ] Nature
- [ ] Digital services
- [ ] Culture
- [ ] Sustainable living
- [ ] Medical services
- [ ] Employment
- [ ] Schools
- [ ] Other: _____

3. If you live in a rural area how do you want to work/study? *

Mark only one oval.

- ◯ In the city
- ◯ From home
- ◯ Hybrid
- ◯ Shared remote spaces
- ◯ Other: _____

4. What would be your main preference for transport? *

Mark only one oval.

- ◯ Own car
- ◯ Public transport
- ◯ Transport pool (shared bikes, cars, etc.)
- ◯ Other: _____

5. If "OWN CAR" was selected: What would make you change to alternatives?

_____

_____

_____

_____

_____

6. What would be your preferred way of housing? *

Mark only one oval.

- ◯ Traditional country house
- ◯ Tiny house
- ◯ Apartment
- ◯ Co-living
- ◯ Other: _____

7. When it comes to socialise with other people would you want to do it digitally or in person? *

Mark only one oval.

	1	2	3	4	5	
Digital	◯	◯	◯	◯	◯	In person

8. To live more sustainably, what behavior would you be willing to start doing? (Choose two) *

Check all that apply.

- [ ] Sharing economy (sharing tools, transport etc.)
- [ ] Increased use of digital services
- [ ] Local consumption (buying local)
- [ ] Co-living
- [ ] Less traveling

Other: [ ] _____

9. Why wouldn't you want to live in a rural community? (What are you currently feel generally is missing in a rural area) *

_____

_____

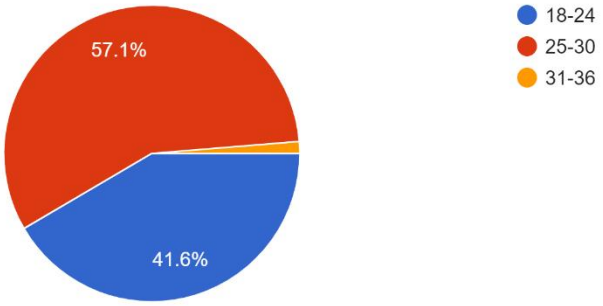
_____

_____

_____

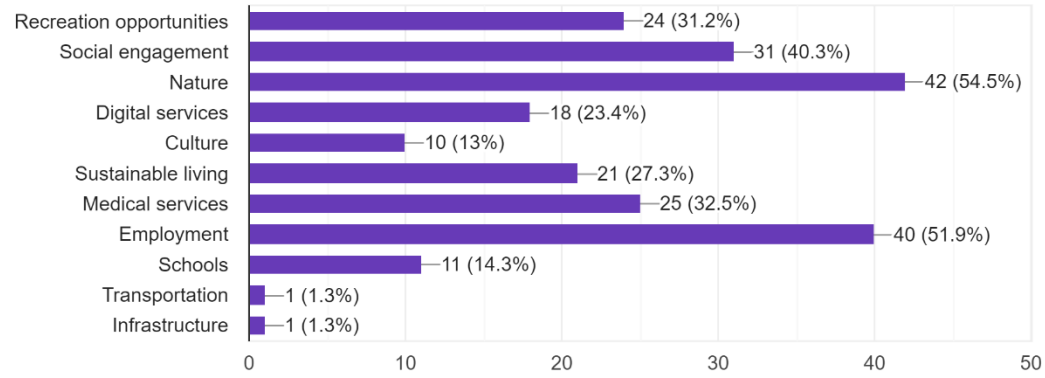
How old are you?

77 responses



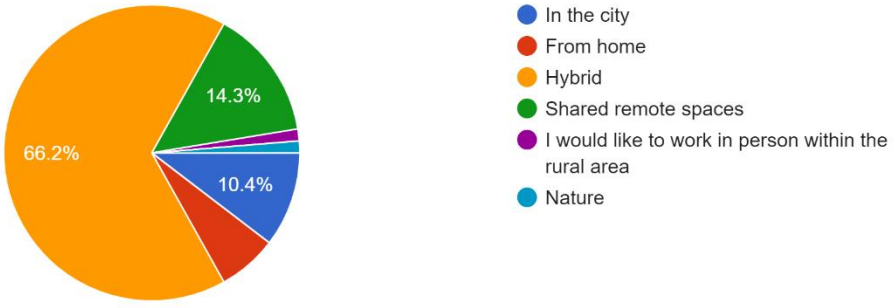
If you would live in a rural area what would be important for you? Pick the three most important.

77 responses



If you live in a rural area how do you want to work/study?

77 responses

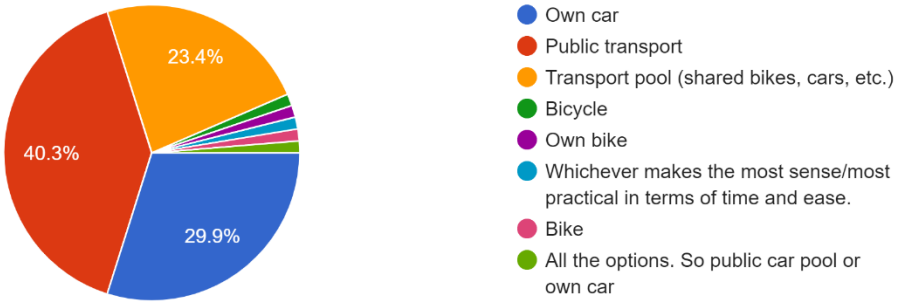


What would be your preferred way of housing?

77 responses

What would be your main preference for transport?

77 responses



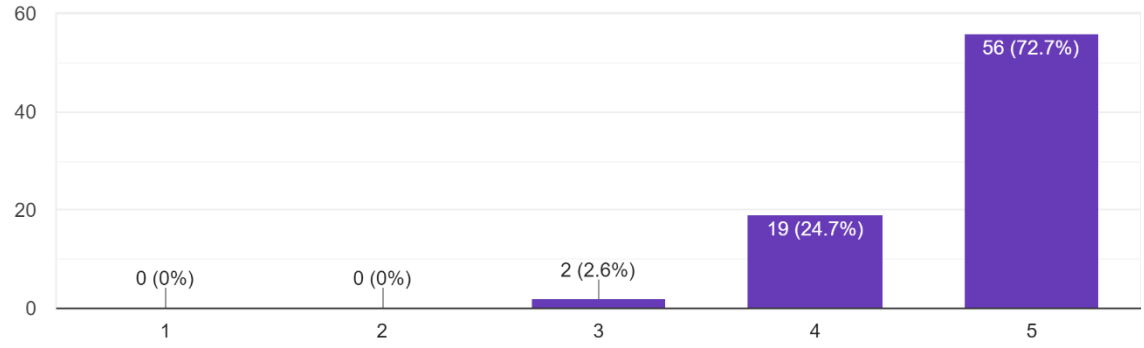
If "OWN CAR" was selected: What would make you change to alternatives?

24 responses

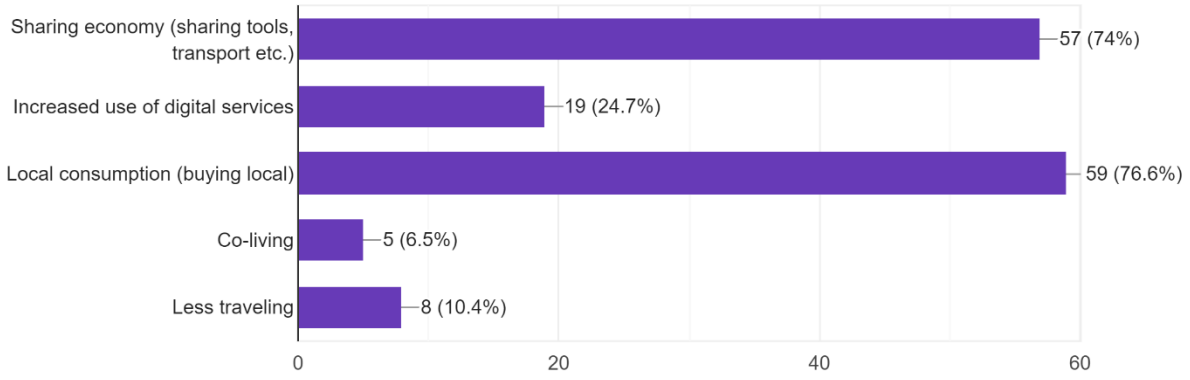
direct train/bus from my neighborhood to the area where i work
If transport pool was reliable
good public transport connection
Public transport frequency (as rural areas have limited frequency of public transport, in general).
Another option with the same level of freedom and mobility.
Good biking roads or free public transport
Expand of the public transport reach and more availability from day to night
Better offering of transport pool
Better public transport
Having friends traveling along with me
Short distances
Electric bike when not raining/ windy
Good connections allowing flexibility
Still have the "full freedom" that an own car provides
Cost

If there's no need to go frequently to the city, I would go by bus if there were enough departures (for example, every half an hour)
Affordable and well-connected public transport
Several departures
Flexibility, to choose when to leave/go to work
Benig able to share/go with public transport but it would still be economically viable compared to BEV for example. Public transport would need to be so much more available, but the question is how that would look while also being sustainable. A whole bus for 4 people isn't great.
Frequent availability
Frequent public transport services, or flat cycling lanes, electric bike seasonal rental
Shared cars, like the one in Stockholm Royal seaport
Assurances that I can move around easily the few times I go into the city

When it comes to socialise with other people would you want to do it digitally or in person?
77 responses



To live more sustainably, what behavior would you be willing to start doing? (Choose two)
77 responses



Why wouldn't you want to live in a rural community? (What are you currently feel generally is missing in a rural area)

77 responses

There is not enough to do, in a city there is always something going on and I will miss that
Lack of services and opportunities compared to Urban areas
Far from job, social engagement, school
Activities like Clubs Cinema Bars Cafes
very few things are walking distance; all the entertainment is concentrated in the city (cafes, bars, cinema etc etc)
Public services in a not-so-far-away distance (hospitals, healthcare, schools, markets). Better possibilities to commute to the city in different hours than only working hours (, (lunch time, evenings, weekends). Public transport connected to each other (for example, train with bus)
Peace.
Infrastructure to have a good quality of living, and access to regular things which we find in a city
Employment
There are variations in rural areas in different countries. Developing countries do not have facilities for basic needs such a schools and medical facilities.That is something which might stop me from considering living in a rural area. In developed nations, I personally do not think there is any thing missing. Unless a person is looking for what they want in a city, like meet new people everyday, make connections, fun and trendy activities and so on. But these things will make rural areas no any different than a city. Living with Nature, healthy and sustainable lifestyle, limited but quality connectivity with people and amenities is what I would look for in a rural area.
Cultural offers are missing
Opportunities for work/school/events are usually in cities. If these things are rather close by, it would be much better.
Commute time to friends
Recreational activities, social life
Internet connection to be able to work from there freely
Variety of services that a bigger city offers
The isolation from other people would be the mayor issue for but if there is a community it'd be great!
I would love to go back to rural community (was born and raised in one lol) but the stark difference in the opportunities (school/jobs) are just undisputable at the moment, that's the main one. Second thing is just the accessibility (mainly for shipment/delivery of stuff, either it's unreachable or it's too expensive). DX
The city offers more options for work, entreteinment, living, education, accessibility, etc..
Friends, social activities
Access to things that a city has, such as international goods, entertainment, etc.
Employment and recreation
My family is not there, and I'm a family person so I'll be concerned by doing so it limits my future kid's opportunities as well as education.
Availability and accessibility to different functions
Culture and events for young people

Limited employment options in the area, low frequency of public transportation, difficulty in accessing good medical facilities
Digital facilities
Low connectivity to world
Entertainment facilities
Career opportunities
Long distances to work.
Limited number of people to socialize with
Digital Infrastructure to enable remote working
Social life, infrastucture, cultural activites, lack of options of services (only one business of each)
Depending on the country, employment mostly
-
Usually requires travel to city for work which is stressful due to traffic/badly timed public transport
Access to services
Far away from family and friends
Social activities
Low accessibility
Sharing economy
Meaningful social engagement
Mosty if there is lacking accessibility, and if I'm far away from friends and family
Less cultural opportunities, people being more traditional and close minded, sometimes less chance of socialization.
Because in the city I am closer to the places I need, and there is more people to socialize with
Good collective transport opportunities
Far less opportunity than in a city under several aspects as education, work and entertainment
Fun
Public transport is bad, limited job opportunities, bad connection to high speed railway network
The main barriers are distance to employment sites and sometimes first needs (hospitals, schools…)
Variety of Leisure activities and fast food chains
Lack of opportunity and Networking opportunities
Far away from everything! Schools, jobs, gym, nightclubs, bars, friends
Accessibility to bacalau
The main reason for not leaving there is being far from friendships and being in a less vibrant environment and too traditional sometimes.
Job opportunities (in the event of no-remote work)
Lack of social engagements and opportunities
Travel time and cheap transport to cities, cultural activities
I want to live in rural community but it should not have some cacophony as of cities. Basic necessities as school, medical facilities and public transportation should be adequate.
Lack of infrastructure and communication
The lack of activities and proper public transport
Low accessibility to services, culture and social life.

Work opportunities
Physical social networking opportunities
Social engagement
Schools for children, work opportunities and socialisation with likeminded people
Basic necessities
Quick Transport Services and lively neighbourhood with little cafes and local stores
Social life
Job opportunities
People and entertainment
Public transportation
Large networks of people with similar personal and professional interests
The traffic may not be convenient
I would love to move to in rural areas

B Appendix 2

Bilaga 4

Resultat av invånardialog 2014

I arbetet med att skriva utvecklingsstrategin Skellefteå 2030 har olika typer av dialoger varit centrala. De har skett i flera steg; initialt hölls en bred dialog i form av möten runt om i kommunen våren 2014, sedan följde en mindre omfattande dialog kring inriktningsunderlag till strategi hösten 2014. Det sista steget var en remissrunda under mars 2015. Denna bilaga redovisar en sammanfattning av de två första invånardialogerna, samt hur de påverkat det förslag till strategi som gick ut på remiss 2015. (Se Bilaga 3 Remissredogörelse för resultat av remissrundan)

Nedan presenteras de teman som återkom i kommentarerna från vårens inledande dialog, de teman som kommit upp i dialog nummer två, samt vilken del av det strategiförslag som gick ut på remiss de relaterar till. Många teman ur dialogmaterialet kan återfinnas i remissförslaget, vissa gånger är dock kommentarerna mera detaljerade medan förslaget behandlar mera övergripande ämnen. Många av kommentarerna handlar om att utveckla enskilda aktiviteter, platser, branscher och liknande. Dessa har både gått till berörda verksamheter inom kommunorganisationen som underlag för utveckling av enskilda insatser, samt använts som underlag till remissförslaget. De har då sammanställts i bredare teman. Detta för att fokusera strategin på den långsiktiga utvecklingen av hela platsen. Detaljerade förslag och kommentarer kommer även att behandlas i fortsatt arbete kring vilka konkreta insatser som behövs under respektive strategiområde.

De kommentarer som berör arbetet med att skriva strategin, och att genomföra den, har beaktats i utformningen av processen hittills. Det kommer även att ligga till grund för det fortsatta arbetet.

I tabellen som följer kan du se kommentarna från invånardialogerna våren och hösten 2014 relaterar till remissförslaget, samt hur kommentarerna värderats och sammanställts. Om du vill veta mer om de invånardialoger som förts under våren respektive hösten 2014 finns mer information om dessa efter tabellen samt på www.skelleftea2030.se.

Innehåll remissutkast Skellefteå 2030	Återkommande teman, dialog våren 2014	Teman i kommentarer hösten 2014
	Ungefärligt antal invånare som kommenterat: 900	Ungefärligt antal kommentarer: 45
Globalt konkurrenskraftig ekonomi		
	Entreprenörsutbildning mot ägarskifte	Jobb behövs, Snabbare för utrikesfödda att komma in på arbetsmarknaden, Stärk entreprenörskapet, Jobb
	Finansiellt stöd vid ägarskifte	
	Stöd och hjälp vid övergång	
	Riktad marknadsföring till företag (även offentliga)	
	Visa fördelar med etablering i kommunen (finns arbetskraft, lägre personalomsättning, billiga lokaler, utbyggt it-nätverk)	
	Fler kvinnliga entreprenörer	
	Skapa förutsättningar för etableringar (anpassade lokaler, billiga lokaler, kommunikation)	
	Underlätta att starta eget – ekonomiskt stöd, ta tillvara på idéer, nyetableringar, samverkan mellan branscher, företag, andra länder	
	Satsa på idéer, forskning, vidareförädling,	
Kunskap och unik kompetens		
	Mindre grupper, Fler lärare	Utveckla relation till universiteten i Umeå och Luleå, högre utbildning, Stärk entreprenörskapet,
	Utveckla skolmiljö (ekologisk mat, mer idrott, specialstöd)	Skolan. Utveckla skola och barnomsorg
	Ökat utbildningsutbud	Skolan. Öka lärares status. Mindre grupper.
	Fler linjer (gymnasiet)	

Innehåll remiss-utkast Skellefteå 2030	Återkommande teman, dialog våren 2014	Teman i kommentarer hösten 2014
Kunskap och unik kompetens forts.		
	Större behov av yrkesförberedande utbildningar	
	Bevara befintliga skolor ute i kommunen	
	Väl utbyggd barnomsorg viktig för inflyttning	
	Öka ungdomars kunskap om företagande redan i grundskolan	
	Bredda utbudet av utbildningar, Nya studieformer – distans, forskning, samarbete med näringslivet, Matchning mot kompetensbehov, Nya kompetenslösningar – plugga halvfart och jobba, fortbildning på orten, samarbete företag och utbildning	
Hållbara och varierade livsmiljöer		
	Fler bostäder i centrala Skellefteå och serviceorterna (lägenheter, tomter)	Landsbygdsutveckling, Turism som landsbygdsutveckling, Hela kommunen kan inte växa, Aktiviteter och upplevelser längst kusten, i havet, Aktiviteter och upplevelser vid älven, Nya upplevelser, Gratis aktiviteter för barn och unga, Etablering av handel, Nöje och kultur, Utveckla kulturlivet, Utveckla Vitberget som friluftsområde, Utveckla friluftsområden, Bättre skött skog
	Behov av frigjorda tomter i kommunen	Längre öppettider på vårdcentraler, Mobila vårdcentraler. Bättre omhändertagande av äldre, Utveckla lasarettet, trygghet, Vårda naturen
	Förenkla bygglovsprocessen	Nya bostäder, Bostäder, Hyreslägenheter, Billigare, Små bostäder behöver byggas, Planberedskap från kommunen behövs, Skebo borde bygga mer, Hyresrätter behövs, Bostäder behövs, Planera för fler bostäder, Bostäder och fritidshus vid älv och kust, Moderna boenden, Mer bostäder, Billiga studentbostäder
	Möjliggör byggnation: strandnära exploatering och lån	
	Seniorbostäder på landsbygden	
	Bostäder till unga och studenter (billiga)	
	Mer fritidsmöjligheter för tjejer (idrott, aktivitet, mötesplats osv)	
	Måste satsa på bra ledare inom ungdomsidrotten	
	Skapa tillgänglighet/marknadsföra aktiviteter	
	Vikten av befintliga anläggningar i kommunen	
	Fler sportanläggningar (multihall mm)	
	Bättre nyttjande av vattnet (älv, hav, holmar, kust)	
	Tillgängliggör naturmiljön (skyltning/belysning)	
	Nyttja naturen bättre (skogen, bergen, älven, skärgården)	
	Större fritidsutbud för unga (replokal osv)	
	Fler aktiviteter för barnfamiljer	
	Evenemang över hela året	
	Mer liv i centrum (längre öppettider, utbud på kvällar)	

Innehåll remissutkast Skellefteå 2030	Återkommande teman, dialog våren 2014	Teman i kommentarer hösten 2014
Hållbara och varierade livsmiljöer forts.		
	Evenemang i orterna	
	Riv gamla och bygg nya lekparker	
	Etablera nya anläggningar (äventyrsbad, casino, ridhus)	
	Kulturhus	
	Mer satsningar på ytterområdena	
	Mer handel centralt	
	Fler caféer och restauranger (vegetariskt, halal)	
	Utveckla och återuppta Folkets hus och badhusen	
	Rusta upp kulturverksamheter (kyrkstad m m)	
	Underlätta utförande av arrangemang (stöd, bidrag, enklare processer)	
	Synliggöra arrangemang i kommunen (webb, blogg o s v)	
	Satsa på föreningar (mer än bara idrott, öka samverkan, bra mötesplatser)	
	Utveckla turismen (havet/skärgården, paketerbjudanden, marknadsför kontraster, nya och gamla anläggningar, året-om-attraktioner)	
	Vackrare och trevligare miljö (mer färg, mindre avgaser, utöka parken)	
	Levande/snygga centrum i orterna	
	Våga bygga sådant som sticker ut	
	Riv eller omvandla/renovera gamla hus	
	Bättre underhåll av grönområden	
	Utveckla havet/skärgården (småbåtshamn, uthyrning, badplaster, båttrafik)	
	Större komfort (sittplatser och allmänna toaletter i orternas centrum)	
	Skapa mötesplatser (i närområdet, utomhus, blandade åldrar, nya idéer)	
	Fler mötesplatser där nyanlända kan möta skelleftebor	
	Mer liv i centrum (utveckla handel, uteliv och öppettider)	
	Flexibla öppettider för handeln	
	Naturen lockar människor till bosättning	
	Strandnära exploatering	
	Valfrihet inom äldreomsorgen	
	Tillgänglig vård i hela kommunen	
	Näthandel både konkurrens och möjlighet	
	Varuhemsändning viktig	
	Behov av ATG-ombud på landsbygden	
	Stöd till dagligvaruhandel på landsbygden	
	Flexibla öppettider	
Överbryggade avstånd		
	Omdragning av E4:an	Kommunikationer
	Behov av broar i Skellefteå	Dra inte om E4, Utvecklad busstation, Nya kollektivtrafiklösningar, utbyggd kollektivtrafik på landsbygden, nya lösningar för kollektivtrafik på landsbygden, centrumbro
	Erbjuda fiber på landsbygden	Fler internationella flygavgångar, regionalt tåg, tåg, flyg

Innehåll remissutkast Skellefteå 2030	Återkommande teman, dialog våren 2014	Teman i kommentarer hösten 2014
Överbryggade avstånd forts.		
	Snabbare och bättre mobilnät på landsbygden	Bredband
	Öppet nätverk i centrala Skellefteå	
	Bättre underhåll av vägnätet (omläggning, plogning, sandning)	
	Säkrare vägar	
	Fler direktflyg och charterresor	
	Billigare biljetter	
	Bättre kommunikationer mellan flygplats och serviceorter	
	Flyget är viktigt	
	Fler och säkrare cykelvägar i hela kommunen	
	Billigare biljetter	
	Bättre kommunikationer mellan flygplats och serviceorter	
	Flyget är viktigt	
	Fler och säkrare cykelvägar i hela kommunen	
	Etablera hyrcyklar/cykelpooler	
	Förverkligande av Norrbotniabanan	
	Satsa på testbanan	
	Utnyttja befintliga spår till persontrafik	
	Transportnod i centrala Skellefteå (järnvägsstation/ busstation/färjetrafik)	
	Färjetrafik (Finland, Umeå och Stockholm)	
	Bussar till aktiviteter/evenemang	
	Bättre bussförbindelser till och från orter samt mellan orter	
	Fler bussavgångar helger och kvällar	
	Bättre stadsbussnät, synkroniserad anslutningstrafik, tydlig information	
	Minska bilberoende (bilpool, pendlingsparkering och samåkning,	
	minska biltrafik i centrum, möjliggöra att leva utan bil)	
	Modernisering/effektivisering av kollektivtrafik (attraktivare bussar med miljöbränsle, wifi & snygg design, minibussar)	
	Bättre bussförbindelser mellan orterna	
Övrigt		
Berikande samarbeten och utbyten, Bilden av Skellefteå, Entreprenöriell och medskapande samhällsutveckling, genomförande, Handlingsplan.	Våga tänka målgruppsanpassat i genomförandet av strategin: gör målgruppsanalyser för att hitta insatser som möter olika skeden i livet. Tänk på både kvarstannare, inflyttare (inkl. medflyttare). Fokus unga: möjlighet att påverka, utveckla, delta. Se hela kommunen, stad och landsbygd. Erbjuda förmåner för att locka arbetskraft (dagisplats, högre lön, billigt boende osv). Kombinera de direkta, mera enkla utvecklingsinsatserna med långsiktiga förändringar. Attrahera utländska studenter som vill plugga/pitcha sin ide/jobba (genom gratis boende). Våga mer Visa upp Skellefteås och Skelleftebornas styrkor, och synliggör den positiva utveckling/initiativ som sker här, inåt och utåt. Visa på alternativ till storstaden och det storskaliga, förstärk det positiva med en mindre stad plus landsbygd: förutsättningar för slow life, trygghet, gemenskap, lite tid för resor och transporter i vardagen, nära till natur och fritid – marknadsför livsstilarna. Utveckla bevara medias rapportering från Norrland. Marknadsför planer för förändring i fysisk miljö, visa att det ”händer saker” Samverka mera mellan generationer. Utveckla mer samverkan mellan företag i serviceorterna, tillväxtnätverk i de olika orterna är bra, fortsätt att utveckla. Utnyttja drivkraften i kvarteren och det lilla grannskapet som finns.	Medborgarlön
		fler internationella flygavgångar, regionalt tåg, tåg, flyg

Innehåll remiss-utkast Skellefteå 2030	Återkommande teman, dialog våren 2014	Teman i kommentarer hösten 2014
Övrigt forts.		
	Samtala kring//förtydliga vem som kan göra vad i genomförande. Byarna vill vara delaktiga. Där blir det verkstad av idéer. Engagemang samt kunskap och erfarenhet av att driva utvecklingsarbete. Byautvecklingsrådet kan vara byarnas röst i utvecklingsdialogen. Se pensionärer som en resurs. Använd resurser som redan finns i samhället och gör saker tillsammans, bredda kunskapen om vilka resurser som finns. Öronmärk kommunala pengar till genomförande för att smörja processen. Fokusera strategin på vad som behöver göras annorlunda i framtiden. Strategin bör förstärka platsvarumärket, genomföra/se till att vi lever upp till devisen ge idéerna plats. 2030-processen/strategin bör måla upp en bild av vad Skellefteå är i framtiden, etablera gemensam målbild och se till att vi talar samma språk. Hitta realistisk ambitionsnivå – kommer krävas mycket för brett engagemang i dessa frågor. Strategin behöver visa på modiga prioriteringar samtidigt som den inte ska exkludera någon grupp ur samhället. Vi bör satsa på saker vi är bra på, använd Skellefteås befintliga förutsättningar på bästa sätt. Se och inspireras av SJ:s 100 punkter för utveckling (tidigare satsning) där tydliga utvecklingsområden pekades ut, och följdes upp offentligt. Våga prioritera, synliggöra utvecklingen och följa upp resultatet tydligt. Vi måste bygga ett system/strategi/handlingsplan där vi kontinuerligt förnyar så vi håller liv i genomförandet och får något nytt/nya faser att lansera kontinuerligt. Någon typ av trappsteg som vi klättrar på under åren? Utveckla analysen av sambandet mellan ekonomisk tillväxt och befolkningstillväxt. 2030-processen bör bidra till att utveckla en gemensam bild av vad Skellefteå är idag och vad Skellefteå ska bli framöver. 2030-processen/strategin bör måla upp en bild av vad Skellefteå är i framtiden, etablera gemensam målbild och se till att vi talar samma språk. Arbetet bör bidra till att skapa en utvecklingsmiljö – en plats där människor, idéer och organisationer växer. Bygg en känsla av att vår kommun är på väg framåt, Gnosjöanda, lyftkranar, att vi tror på visionen, positiv attityd, stolthet och framtidstro. Vi måste nå ut med budskapet att Skellefteå 2030 inte bara är ”mer av allt”, utan prioriteringar och omställning av samhället. Processen behöver stärka både kort- och långsiktiga, små och stora förändringar/utveckling. Försök klargöra/hantera ansvarsfördelning, vem gör vad. Förbered för att befolkningsstrukturen kommer att fortsätta förändras underkommande år. Hur stärka verkstad och uppmuntra handlingskraft redan ht -14, våren -15? Hur kan aktörer 2030-flagga sina aktiviteter redan nu? Den största utmaningen är kanske inte att utforma en strategi utan att skapa uthållighet, hur hålla liv i arbetet i 16 år? Viktigt att få bollar i rullning, att det börjar hända saker. Det förstärker uthålligheten. Stärk känslan av att det händer saker. Till exempel genom fysiska förändringar. Men även genom tydliga avstämningspunkter i handlingsplanen Uppmuntra till kultur av öppenhet och nyfikenhet, välkomnande bemötande.	
		Kultur av öppenhet, välkomnande
		Sociala nätverk behövs, Utveckla relation till Region Västerbotten, Utveckla relation till Umeå Stolthet och marknadsföring

		Handlingskraft, att det händer saker. Civilsamhällets roll: Ambassadörer, Faddrar åt nyinflyttad, Utveckla föreningslivet, Positiva attityder till Skellefteå, visa stolthet. Invånar-dialog, utsatta gruppers möjlighet att utforma sina liv

INVÅNARDIALOG VÅREN 2014

Skellefteå kommun inledde arbetet med att skriva en utvecklingsstrategi hösten 2013 med att beställa och läsa rapporter om hur Skellefteå utvecklas i förhållande till övriga världen, jämfört med andra städer och på en regional och nationell nivå. Vilka trender som råder undersöktes och kommunen tog också del av forskning och teorier kring hur en plats kan utvecklas *.

Internt anordnade kommunen också workshops med deltagare från de olika förvaltningarna. Allt detta arbete ligger till grund för den bakgrundsanalys som tagits fram där Skellefteå kommuns styrkor, svagheter, möjligheter och hot belysts. På så sätt har kommunen kunnat framställa ett underlag med fyra fokusområden – Kompetens & sysselsättning, Levnadsmiljö & upplevelser, Grundläggande service och Kommunikationer – som efter bakgrundsanalysen bedömdes vara de områden som Skellefteå kommun främst behövde utvecklas inom. Dessa blev därför de övergripande områden som diskuterades under de så kallade framtidsworkshops som ägde rum under de inledande månaderna av 2014. I dessa öppna och uppsökande möten utvecklades fokusområdena tillsammans med intresserade och drivna Skelleftebor.

Syftet med invånardialogen var att skapa en känsla av samhörighet och gemensamt ansvar, öka politikernas kunskap om medborgarnas prioriteringar och behov för ett bättre beslutsunderlag, bidra till ett ökat inflytande och aktivt medborgarskap, samt sprida kunskap om strategiarbetet. Dryga 900 personer deltog *.

INVÅNARDIALOG HÖSTEN 2014

I processens nästa fas arbetade tjänstepersoner inom den kommunala organisationen med att sammanställa, analysera och värdera det material som inkom vid framtidsworkshoparna. Under analysarbetet av kommentarerna delades materialet in efter fokusområde där varje område också hade ett flertal underkategorier. Denna tematisering av kommentarerna gav en tydligare överblick över vad som återkommande diskuterades under samtalen. Parallellt med kommunens analys har också två universitetsstudenter arbetat med sammanställning av materialet. Detta för att kvalitetssäkra arbetet och säkerställa att något inte förbisetts i analysen av kommentarerna. Med hjälp av den bakgrundsanalys om Skellefteå kommun som tidigare gjorts har värderingen av kommentarerna genomförts och slutligen ett underlag med mål och insatsområden kunnat arbetas fram.

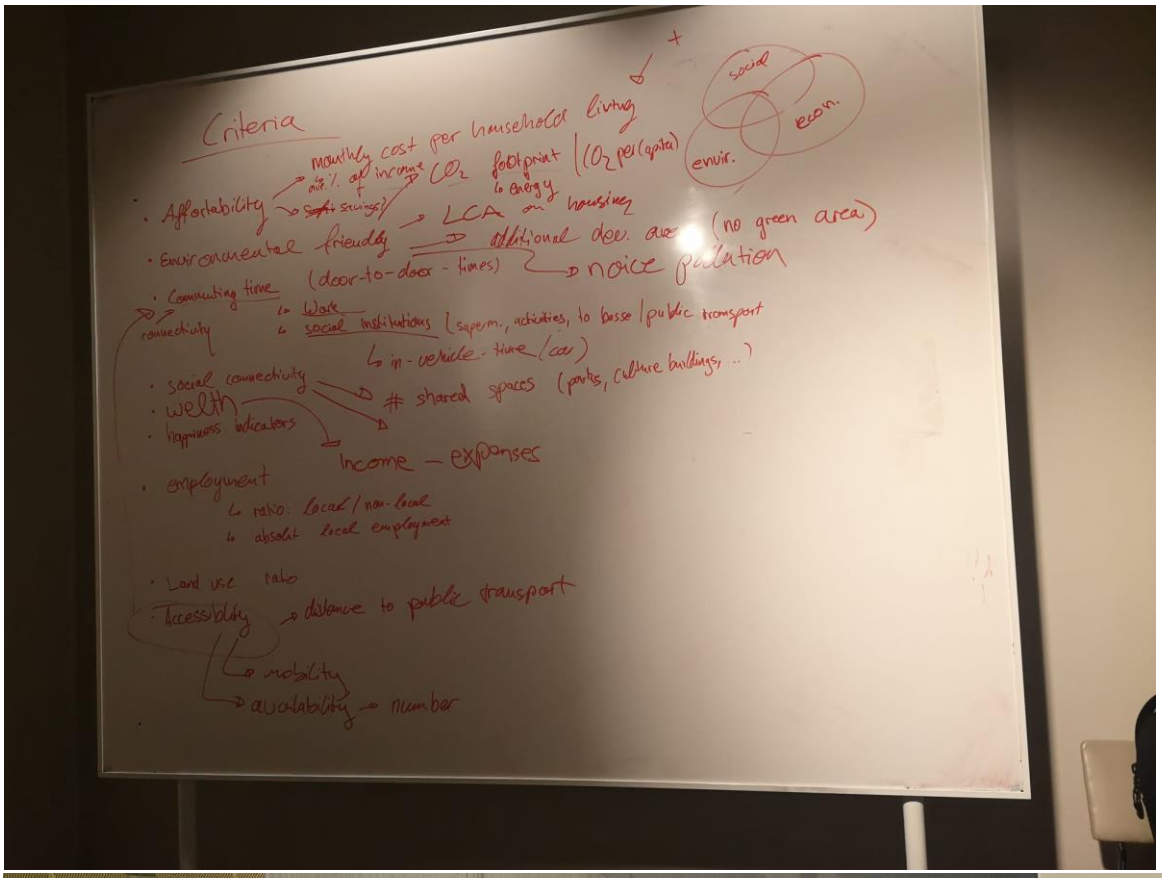
Detta resulterade i ett inriktningsunderlag till strategin Skellefteå 2030 som presenterades i november 2014 med förslag till mål och insatsområden. Följaktligen är underlaget inte en sammanfattning av kommentarerna från framtidssamtalen. Materialet från dialogerna har varit en central källa med en stark påverkan på innehållet i det presenterade förslaget. (Läs mer om kopplingen mellan dialog och inriktningsunderlag *.

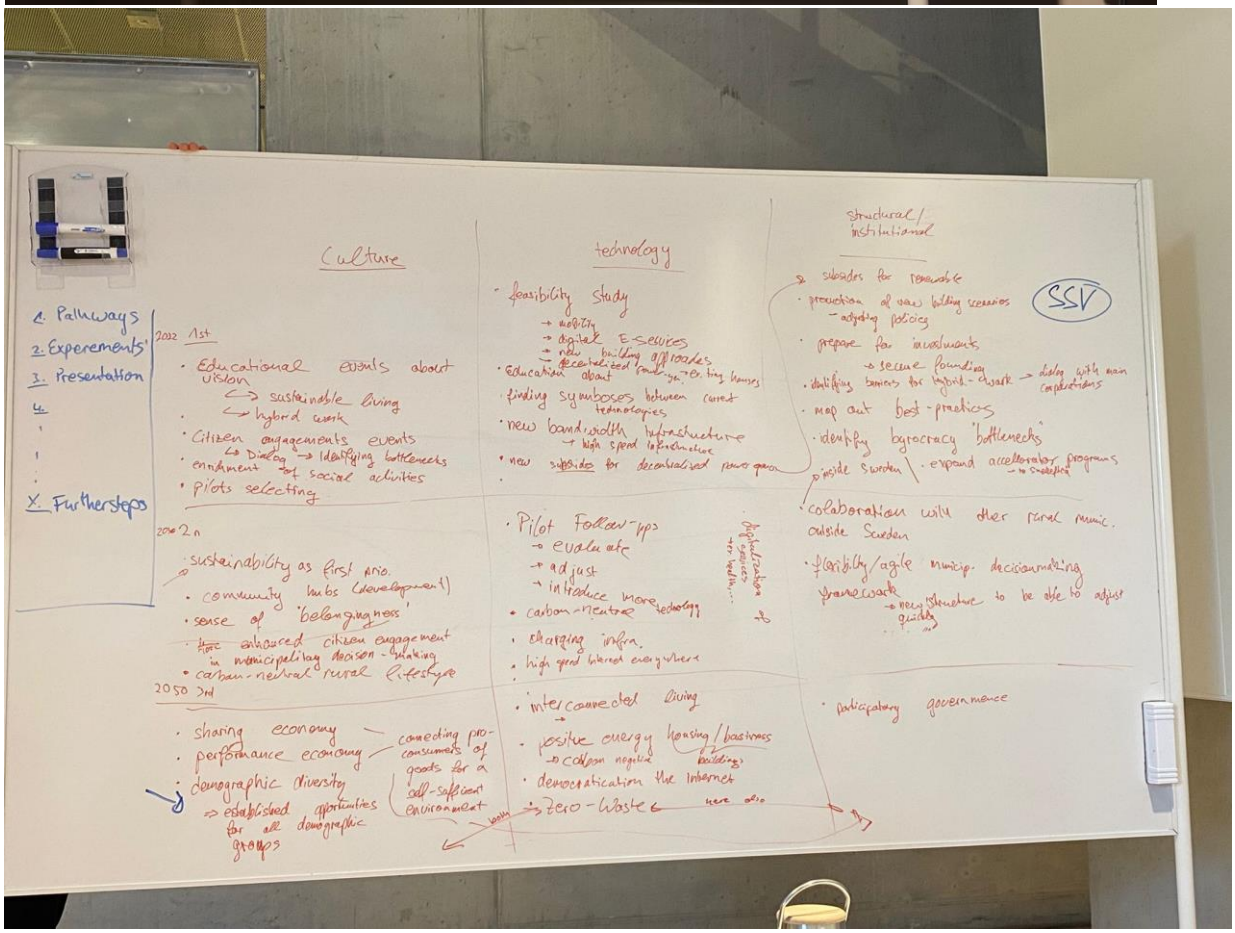
Syftet med att offentliggöra inriktningsunderlaget och öppna för kommentarer var att bidra till att skapa en känsla av samhörighet och gemensamt ansvar över utvecklingsarbetet, öka politikernas kunskap om medborgarnas prioriteringar och behov för ett bättre beslutsunderlag, samt bjuda in till ökat inflytande och aktivt medborgarskap och sprida kunskap om strategiarbetet.

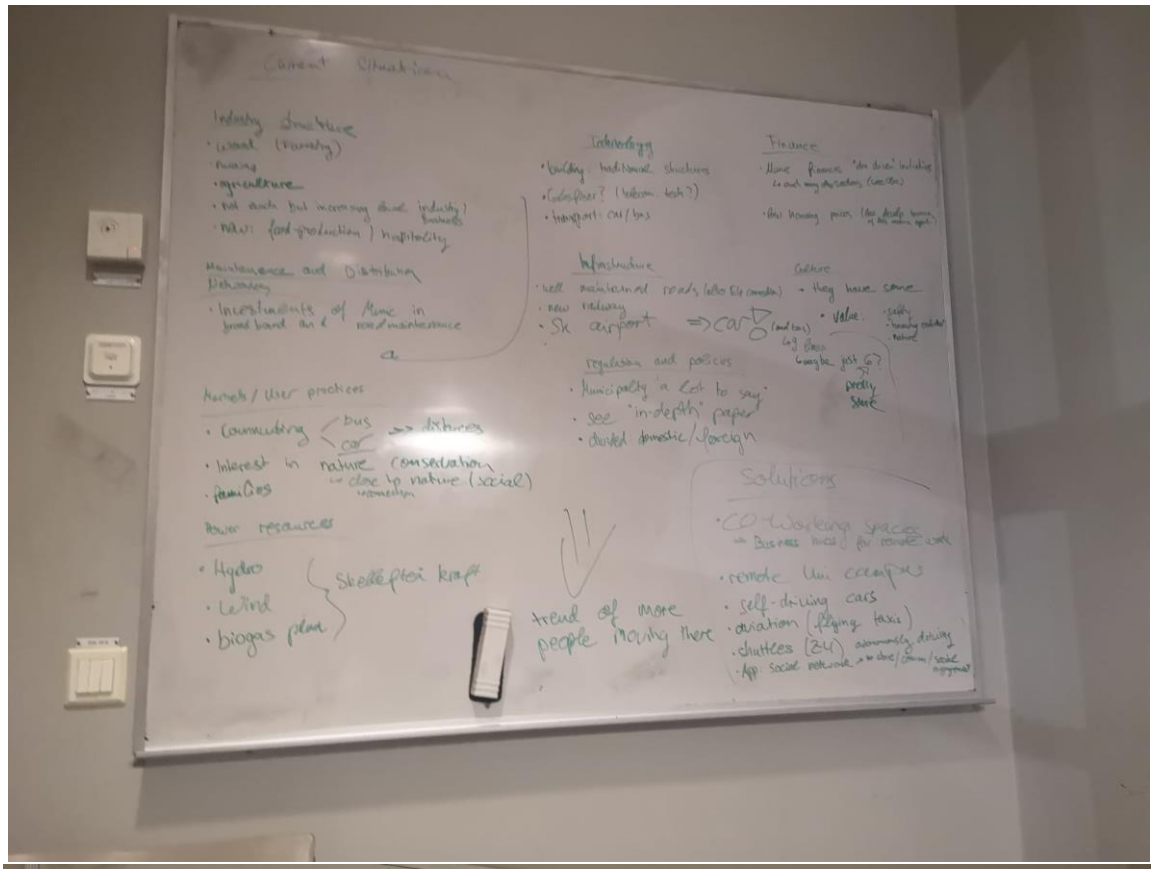
Drygt 40 olika kommentarer lämnades in. Dessa har sorterats i teman och beaktats i arbetet med att utveckla inriktningsunderlaget till det förslag som sedan gick ut på remiss. I tillägg har workshops hållits med ledande politiker och chefer inom kommunorganisationen, samt med den referensgrupp bestående av företrädare för näringsliv, föreningar och akademi som följer 2030-arbetet. Även dessa påverkade hur förslaget utvecklades från inriktningsunderlag till remissversion.

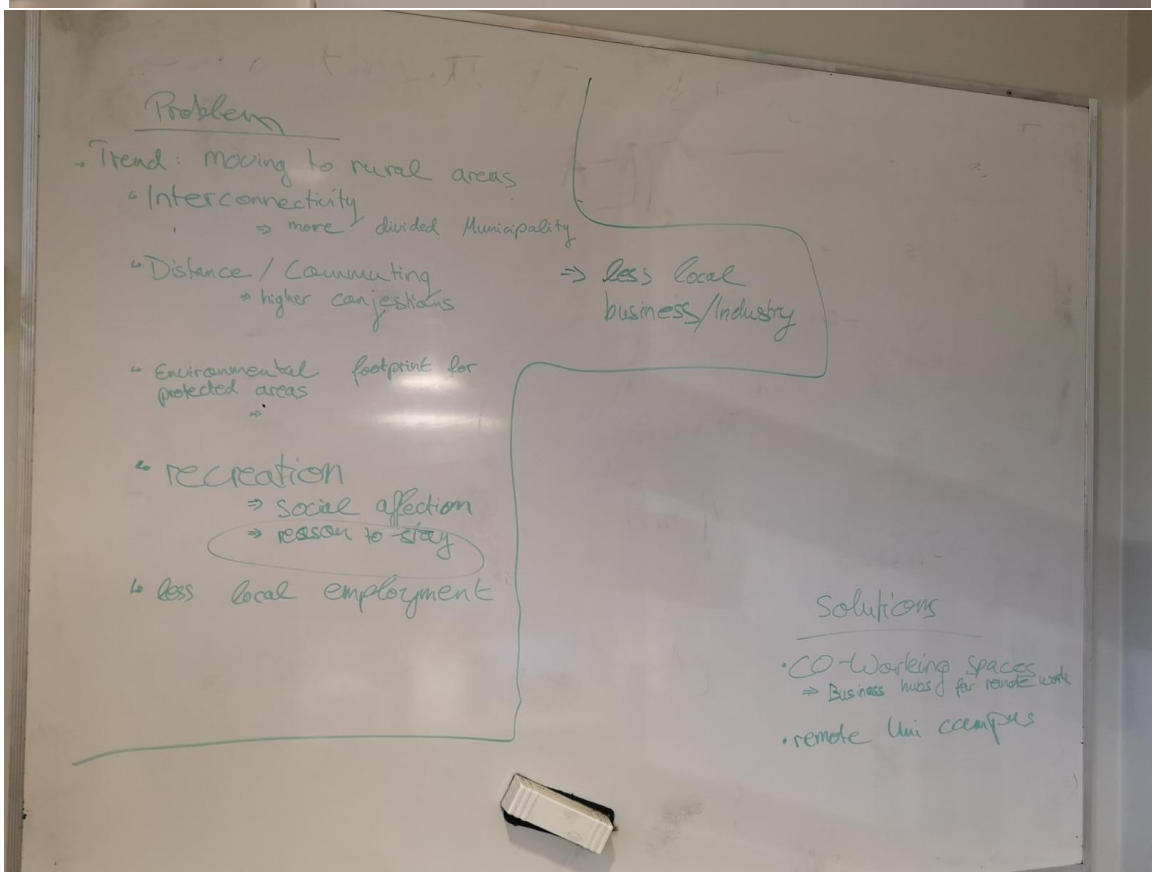
** Läs mer på www.skelleftea2030.se*

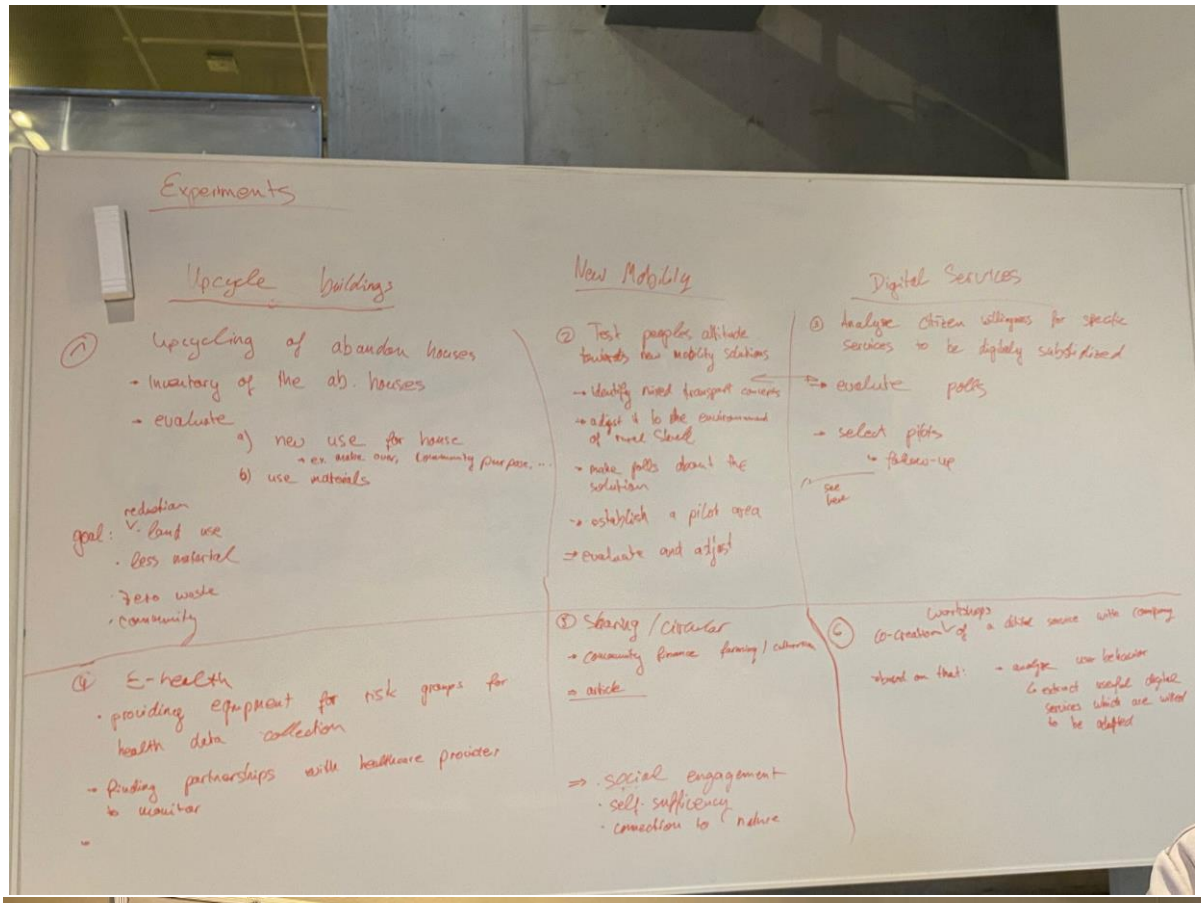
C Appendix 3

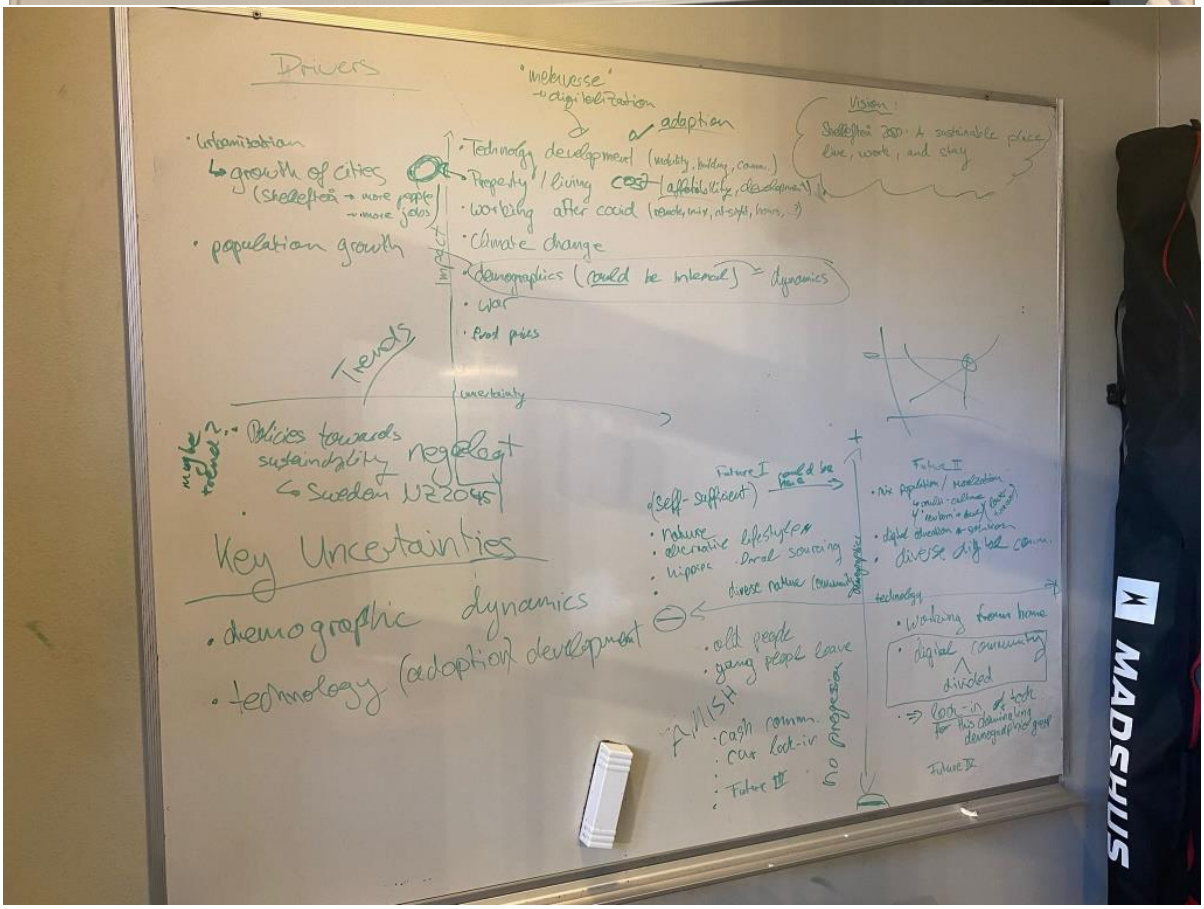

Criteria
social
econ.
envir.
Affordability
monthly cost per household living
% of income
CO2 footprint
(CO2 per capita)
Environmental friendly
LCA on housing
additional dev. area (no green area)
(door-to-door - times)
noise pollution
Commuting time
connectivity
Work
social institutions (supern., activities, to basse
public transport
in-vehicle time (car)
social connectivity
Wealth
happiness indicators
shared spaces (parks, culture buildings, ...)
Income - expenses
employment
ratio: local / non-local
absolut local employment
Land use ratio
Accessibility
distance to public transport
mobility
availability
number

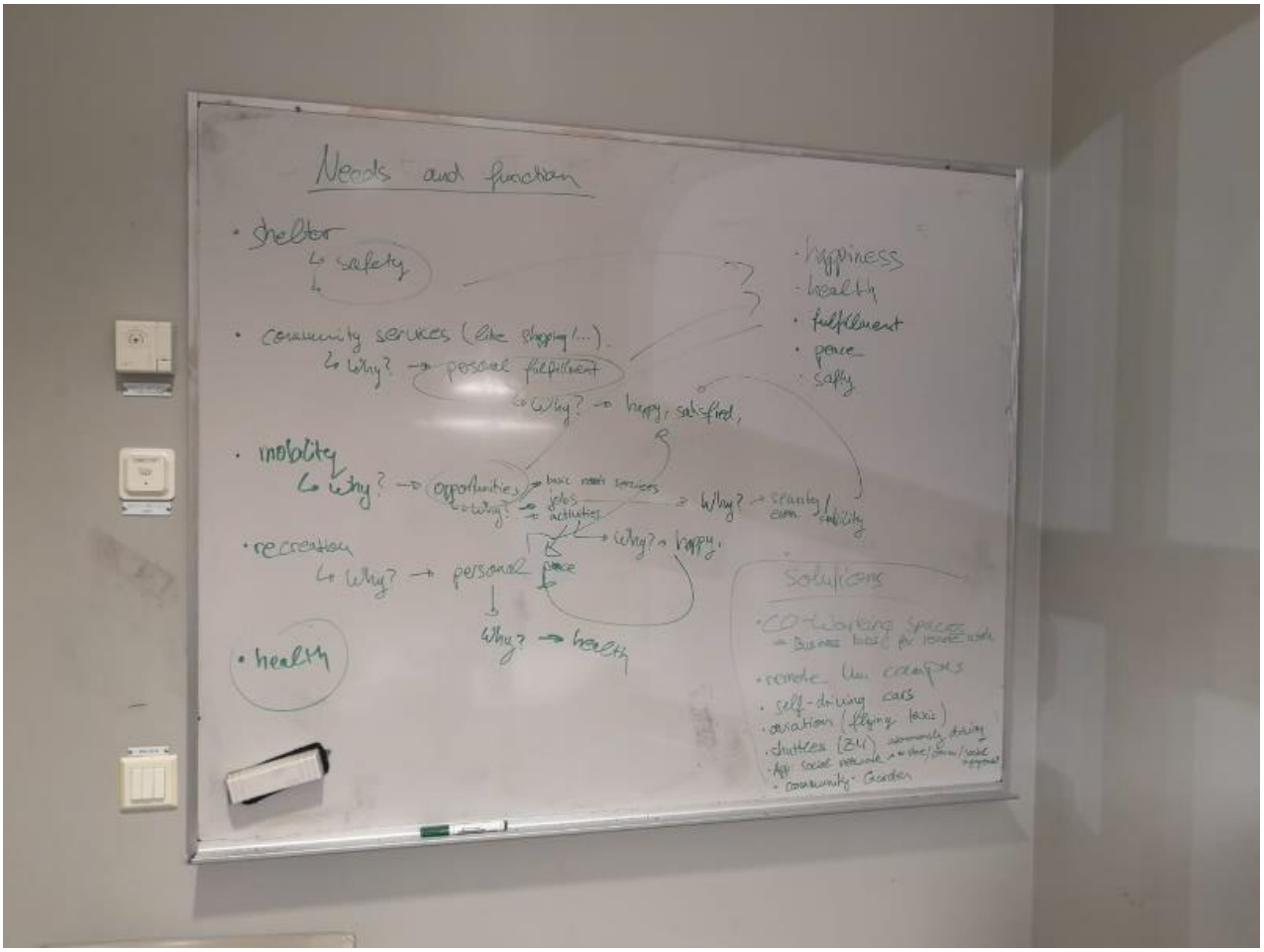

Culture
technology
structural / institutional
1. Pathways
2. Experements
3. Presentation
4.
X. Furthersteps
2022 1st
Educational events about vision
sustainable living
hybrid work
Citizen engagements events
Dialog → identifying bottlenecks
enrichment of social activities
Pilots selecting
2022 n
sustainability as first aria
community hubs (development)
sense of 'belongingness'
enhanced citizen engagement in municipal decision-making
carbon-neutral rural lifestyle
2050 >n
sharing economy
performance economy
demographic diversity
→ established opportunities for all demographic groups
connecting pro-consumers of goods for a self-sufficient environment
feasibility study
→ mobility
→ digital E-services
→ new building approaches
→ decentralized energy → existing houses
Education about
finding symbioses between current technologies
new bandwidth infrastructure
→ high speed infrastructure
new subsidies for decentralized renewables
Pilot Follow-ups
→ evaluate
→ adjust
→ introduce more technology
carbon-neutral
charging infra.
high speed internet everywhere
digitalization + logistics
interconnected living
positive energy housing / businesses
→ carbon negative
buildings
democratization the Internet
→ zero-waste
here also
subsidies for renewable
protection of own building resources
- adapting policies
prepare for investments
→ secure foundings
identifying barriers for hybrid-work → dialog with main corporations
map out best-practices
identify bytocracy 'bottlenecks'
inside Sweden
expand accelerator programs
→ scaleups
SSV
collaboration with other rural municip. outside Sweden
flexibility/agile municip. decisionmaking
framework
→ new structure to be able to adjust guides
participatory governance


Current Situation
Industry Structure
Infrastructure
Finance
Culture
Regulation and policies
Market / User practices
Power resources
Solutions
trend of more people moving there


Problem
Trend: moving to rural areas
Interconnectivity
=> more divided Municipality
Distance / Commuting
=> higher congestions
=> less local business/industry
Environmental footprint for protected areas
recreation
=> social affection
=> reason to stay
less local employment
Solutions
CO-Working spaces
=> Business hubs for remote work
remote Uni courses


Experiments
Upcycle buildings
New Mobility
Digital Services
① Upcycling of abandon houses
• Inventory of the ab. houses
• evaluate
a) new use for house
→ ex. market, community purpose, ...
b) use materials
goal:
reduction
land use
less material
zero waste
community
② Test peoples attitude towards new mobility solutions
→ identify need transport corridors
→ adjust it to the environment of rural Shetland
• make polls about the solution
• establish a pilot area
⇒ evaluate and adjust
③ Analyse citizen willingness for specific services to be digitally subsidised
→ evaluate polls
→ select pilots
→ follow-up
④ E-health
• providing equipment for risk groups for health data collection
→ finding partnerships with healthcare provider to monitor
⑤ Sharing / Circular
→ community finance farming / cultivation
→ article
⇒ social engagement
• self-sufficiency
• connection to nature
⑥ Workshops
Co-creation of a digital service with company
based on that: → analyse user behaviour
→ extract useful digital services which are willed to be adapted


Drivers
"metaverse"
→ digitalization
adaption
Vision:
Shetland 2050: A sustainable place to live, work, and stay
• Urbanization
→ growth of cities (Shetland → more people → more jobs)
• population growth
• Technology development (mobility, building, comm.)
• Property / living cost (affordability, development)
• working after covid (remote, mix, at-office, hours, ?)
• Climate change
• demographics (could be internal) ≈ dynamics
• war
• food prices
Trends
uncertainty
single national
Policies towards sustainability negotiated
→ Sweden U2204S
Key Uncertainties
• demographic dynamics
• technology (adoption) development
Future I (could be Mix of)
(Self-Sufficient)
• Nature
• alternative lifestyles
• Rural sourcing
• hippies
• diverse nature (community)
Future II
• Mix population / moderation
• digital education + generation
• diverse digital comm.
• Working from home
• digital community divided
• ⇒ lock-in of tech for this dominating demographic group
Future III
• old people
• young people leave
• cash comm.
• car lock-in
• Future III
Future IV
technology
demographics
+
−
MADSHUS


Needs and function
• shelter
↳ safety
• community services (like shopping / ...)
↳ Why? → personal fulfillment
↳ Why? → happy, satisfied,
• mobility
↳ Why? → opportunities
↳ Why? → jobs, activities
Why? → happy,
• recreation
↳ Why? → personal space
Why? → health
• health
• happiness
• health
• fulfillment
• peace
• safty
Solutions
• remote
• self-driving cars
• aviation (flying taxi)
• community Garden

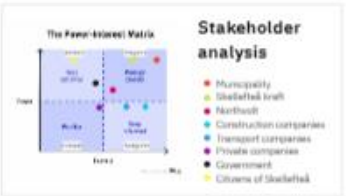
D Appendix 4

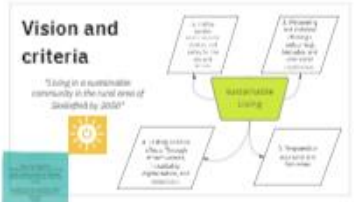
- Big diagram: I didnt get it in the context and what it says
- good current situation
- good reflection on the project work

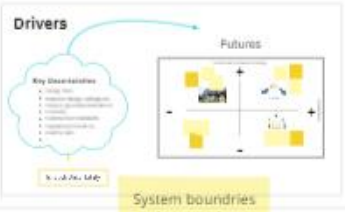
System boundries where unclear (overwhelmed and concrete boundries were lost

Frame 2

Frame 1







System boundries where unclear (overwhelmed and concrete boundries were lost

Frame 6

Frame 3

Questions?

Vision:

creating sustainable, viable and attractive rural areas for people in different phases of life.

hope that at least 1000 people shall settle outside urban area

Employment:
Agriculture and forestry as well as the min
and wood manufacturing

Opportunities
- positive development in rural areas
- sustainable building structure,
- local development,
- service within a reasonable travel time,
- employment opportunities and a long-term
- sustainable transport system.
- turism recreation

Intrconnectivity in terms commuting times
-door to door commuting time
local development
-local business
-technological nomads
-
sustainable transport system
-electric lines
-cars /per capita
household functions
-shopping
-eating opportunities
tourism and recreation

Creating sustainable rural areas in Skellefteå

Frame 4

Solutions testing

Co-working spaces --> business hubs

Remote uni.

self-driving cars

aviation, flying taxis

shuttles E4

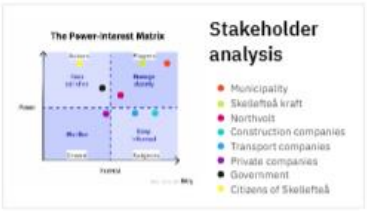
Community garden

App: social network

A circular community, less need for travels to shops etc. can share with neighbors


Creating sustainable living in the countryside


Problem orientation

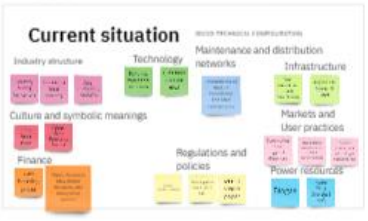

The Power-Interest Matrix
Stakeholder analysis
Municipality
Skellefteå kraft
Northvolt
Construction companies
Transport companies
Private companies
Government
Citizens of Skellefteå


System boundaries
Spatial boundaries
Temporal
2050
Sectorial
Social components (actors)
Technical components

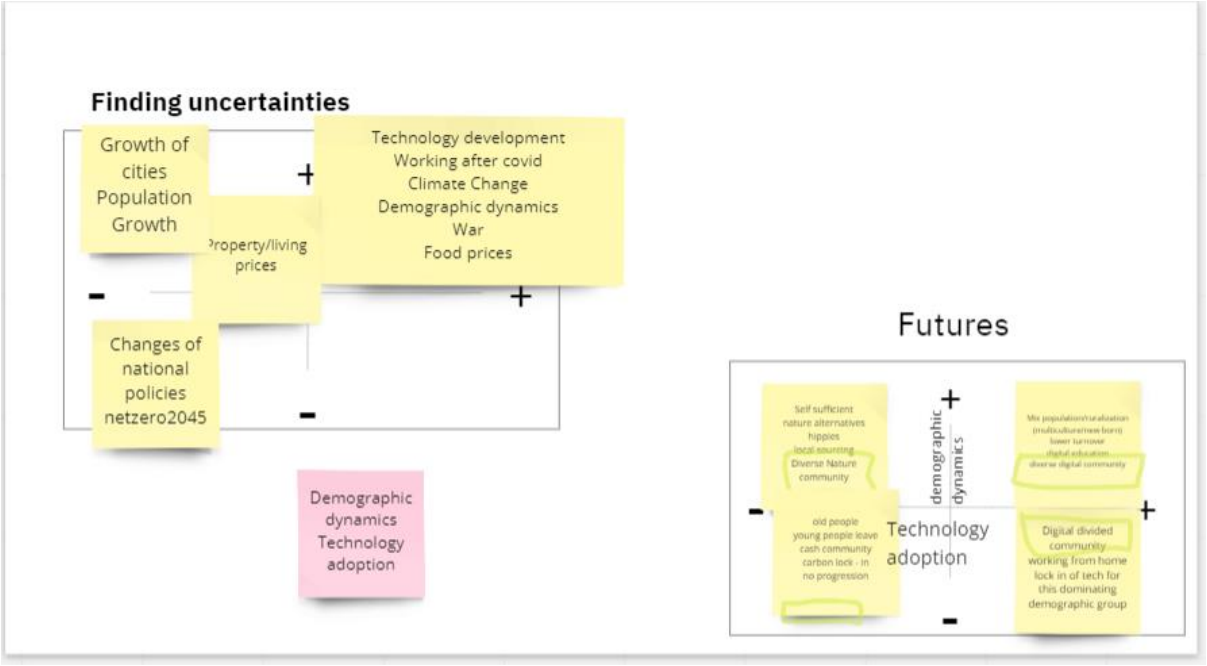

Needs and functions
Shelter
Safety
Mobility
Saftey


Vision and criteria
Social criteria:
Social connectivity
Happiness indicators
Accessibility
Environmental criteria:
Environmental friendly
Economical criteria:
Affordability
Employment


Drivers
Futures
Key Uncertainties


Current situation
Industry structure
Technology
Maintenance and distribution networks
Infrastructure
Culture and symbolic meanings
Markets and User practices
Finance
Regulations and policies
Power resources


Rural Areas of Skellefteå: A sustainable place to live, work and stay


Finding uncertainties
Growth of cities Population Growth
Property/living prices
Technology development
Working after covid
Climate Change
Demographic dynamics
War
Food prices
Changes of national policies netzero2045
Demographic dynamics Technology adoption
Futures
Self sufficient nature alternatives hippies local sourcing Diverse Nature community
old people young people leave cash community carbon lock - in no progression
demographic dynamics
Technology adoption
Digital divided community working from home lock in of tech for this dominating demographic group

Criteria	Dimension	States of dimension			
Social connectivity	Community spaces	None	medium	High	
Environmental friendly	Circular neighborhood	Privately owned	Mixed	Communal	import (from outside rural area)
Accessibility	Variety of transportation	Privately owned	Public transport	Transport pool	
Affordability	Living opportunities	Business as usual	Tiny houses or small individual units	Co-living	
Digital friendly	Digital services Healthcare	Low Digtal	Mixed mixed	High stationary in rural area only in Skellefteå	
Nature connectivity	Recreation opportunities	Low	Medium	High	
Nature conservation	Build environment	Nature	Mixed	Urban area	

Scenario	Community spaces	Circular Neighborhood	Variety of transportation	living opportunities	Digital services	Recreation Opportunities	Build environment	
1 Community engaging	high	circular	transport pool/public transport	Co-living	Mixed	Mixed	Mixed	
2 Nature focused	Mixed	circular	Transport pool	Tiny houses / Co-living	High	High	Nature	
3 Smart and sustainable	Mixed	Circular	Transport pool	Tiny houses/co-living	High	High	Mixed	
4 Urbanizing it	High	Mixed	Privately owned/public transport	Business as usual	Mixed	Low	Urban	
5 Current state	Low	Privately owned	Privately owned	Business as usual	Mixed	High	Mixed	

Multi-criteria decision analysis (MCDA)

Scenario	Community spaces	Circular Neighborhood	Variety of transportation	living opportunities	Digital services	Recreation Opportunities	Build environment	
1 Community engaging	high	circular	transport pool/public transport	Co-living	Mixed	Mixed	Mixed	
2 Nature focused	Mixed	circular	Transport pool	Tiny houses / Co-living	High	High	Nature	
3 Smart and sustainable	Mixed	Circular	Transport pool	Tiny houses/co-living	High	High	Mixed	
4 Urbanizing it	High	Mixed	Privately owned/public transport	Business as usual	Mixed	Low	Urban	
5 Current state	Low	Privately owned	Privately owned	Business as usual	Mixed	High	Mixed	

weight %	Criteria	A Community engaging	B Nature focused	C Smart and sustainable
17	Social connectivity	5	3	4
17	Environmental friendly	4	5	5
12	Accessibility	4	1	4
10	Affordability	5	4	4
17	Digital friendly	3	5	5
17	Nature connectivity	3	5	5
10	Nature conservation	3	5	4
100%	TOTAL (max. 35)	27	28	31
	weighted average	3.83	4.08	4.51